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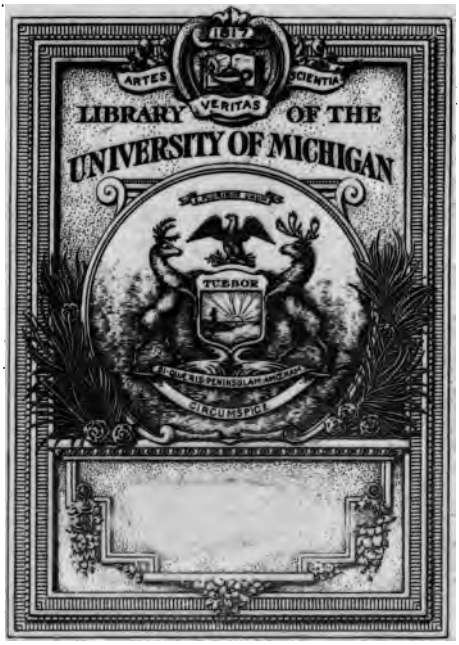
MICHIGAN
AND
ITS RESOURCES



THE GIFT OF
J. Herbert Russell

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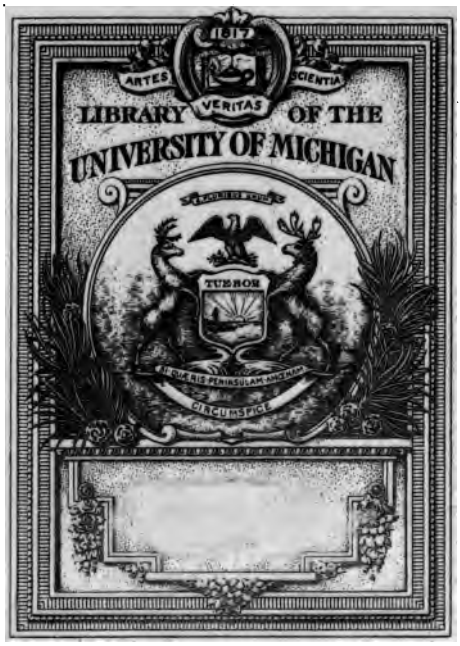

THE GIFT OF
J. Herbert Russell

J. Herbert Russell
gf.
5-11-1923

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MICHIGAN.

The State of Michigan is 9,000 square miles larger than the State of New York; 10,000 larger than Pennsylvania; 16,000 larger than Ohio; 23,000 larger than Indiana; and 1,000 larger than Illinois. The entire area of the six New England States is not quite 12,000 square miles larger than that of Michigan.

When the State was first admitted into the Union, less than 50 years ago, it ranked twenty-third among the States in the order of population. It is now the ninth.

It has a coast line of 1,600 miles—more than half the distance between New York and Liverpool—around which vessels of 2,000 tons may sail without losing sight of its territory.

The largest body of fresh water in the world forms its northern boundary; the second largest its western; except these two, there are no lakes in Europe, Asia or America larger than that which washes its eastern borders; and it has ports on two others. Lying in the embrace of these immense seas, its climate has no equal in the moderation of its temperature in any State or territory situated on the same degrees of latitude east of the Rocky Mountains.

Most of the southern peninsula of the State lies between the same lines of latitude as the State of New York. The shore line of its upper peninsula on Lake Superior is mostly south of the latitude of Quebec. No part of Michigan is as far north as Paris.

It has more than four thousand miles of railroad. Fifty-one county seats out of sixty-seven in the lower peninsula have railroad connections; nine others are lake ports; there are only seven which have no outlet either by rail or water, and none of these is more than twenty miles from a railroad. In the upper peninsula there is only one, and in the lower peninsula there are only eight counties, which are not reached by railroad connections already in operation or in process of construction.

The farmers of Michigan have also the assurance of permanent competition in the rates of transportation to eastern and seaboard markets not only by various rival lines of railroad but by natural and artificial waterways. Every dollar saved in reaching consumers is added to the gains of the producer. The reports of the United States Department of Agriculture show that in a series of five years, previous to and

including 1879, the average cash value per acre of eight leading productions of the farm, taken together, in twelve of the principal farming States of the Union was greater in Michigan than in any other State.

In the order of production Michigan stands first among the States in the growth and manufacture of lumber, first in salt, first in copper, second in iron, first in its fresh-water fisheries, and fourth in wheat. It has the largest iron mine and the largest copper mine in the world. Seven-tenths of all the wheat raised in the country is grown in nine States, and only three excel Michigan in this crop. It is also one of the best fruit-producing States in the Union, and ranks among the highest in its yield of wool. All its principal products are staples, for which there must be a constant and growing demand.

The State is practically free from debt. Its public buildings are paid for. It is prohibited by its constitution from borrowing money in excess of $50,000, except in time of war. The entire local indebtedness of all its cities, villages, towns, counties, and school districts is less than ten millions of dollars. Its taxes are low, and one-third of them all is applied to educational purposes.

The school system of Michigan makes education free to all. The primary schools, the Agricultural College and the University are open without charge for tuition to rich and poor alike. Even in nominations to the Government army and navy schools at West Point and Annapolis it has become an established custom to leave the periodical vacancies open to competitive examination. Young men of every nationality, creed, and condition have precisely the same right to public benefits and equal chances in the race for success.

With all the advantages of a healthy climate, a fertile soil, easy access to home and foreign markets, extraordinary facilities of transportation, a settled society, a generous school system, established institutions, freedom from debt and a low rate of taxation, there are in the State several millions of acres of unoccupied farming lands, suitable to almost every variety of husbandry, some of them open to settlement under United States and State homestead laws, and all of them within reach of moderate means.

THE STATE—GROWTH, POPULATION, AND WEALTH.

The area of Michigan is 56,451 square miles, not quite 2,000 square miles less than the area of England and Wales. When it was admitted into the Union in 1837, its population was 174,467, and at the next federal census, taken in 1840, out of twenty-seven States then belonging to the republic it ranked in the number of its inhabitants the twenty-third.

OBSTACLES TO EARLY DEVELOPMENT.

The early development of the territory which forms the State was slow, and in the face of depressing influences. Ignorant and shiftless surveyors, avoiding the labors, and possibly the hazards of personal explorations, had given false reports of its topography and its resources. Calumnies thus originated, dating as far back as 1815, survived in tradition until a comparatively recent period. Kindred reports concerning the salubrity of the climate helped to impede the progress of the State. When railroads began to absorb the carrying trade of the country they naturally sought eastern and western connections, uniting the valley of the Mississippi with the Atlantic board, and such facilities as the State possessed carried the current of travel through its territory rather than into the recesses of its interior. The great trunk lines have always been united in a common policy to secure the greatest amount of travel to the farthest possible points. Their agents, in the eastern States and abroad, however widely they may diverge in other respects, combine in labors to send those who are seeking western homes beyond Chicago. There are great corporations, owned and controlled in eastern cities, and holding valuable land grants which were originally designed to aid in the settlement of the State, who deem it more important to secure through passenger traffic than to sell lands which they know must yearly enhance in value.

ITS VALUE DISCOVERED.

It is only within a very few years that the northern counties of the lower peninsula have been known and understood, except by a few enterprising men, even among Michigan people. The extension of the lumber interests, seeking fresh material for the mills, led to their first thorough exploration, and it was not until those interests had acquired enormous magnitude that the now undoubted fact was realized that, great as had been their profits, the discoveries they had made and the great wilderness they had partially cleared promised more to agriculture than it had yielded to the axe. Immense tracts of hard-wood timber were found containing no pine, and it was found, too, that large portions of our northern territory which produce the best pine produce also the best crops. There are pine barrens, bearing an inferior and scraggy wood, which the fastidious lumberman utterly neglects, and which are good neither for lumber nor for any thing else. But these occupy only limited areas in what are known as the pine regions of the State, and cover only a comparatively small portion of its territory. Most of the great trees which constitute the pride of our lumber forests, and have made Michigan pine famous, at home and abroad, grow largely among beeches and hard maple and other valuable wood, which only flourish on soils capable of yielding good crops. A few of these noble pines standing among scores of hard timber, give character to the discoveries of the "land-looker" for the saw-mills, while in no wise detracting from the value of the soil on which they grow. Of course there are different degrees of value in these lands, as in all others, and the settler

will exercise the same discretion in his choice as he does in determining other accessories to a home. But there are thousands of acres in Michigan from which pine trees have been cut, as well as many other thousands which have never borne pine, into the soil of which no ploughshare has ever penetrated, which will well repay the labors of the husbandman, and the fee simple of which can be bought for less than a year's rental of many of the lands of Europe.

ROAD BUILDING.

The policy of the State in constructing public wagon roads in advance of the settlements out of land cessions made by the General Government for purposes of reclamation, has been wise and liberal, and has aided largely in opening up the northern counties. Generous land grants were made several years ago by congressional enactment to promote the building of railroads to the Straits of Mackinac, but for a long time some of these grants only retarded settlement by withholding lands from sale, while little progress was made in the work they were designed to advance. This delay is now ended. A line has been for some time in operation which connects Grand and Little Traverse bays with all the great thoroughfares of the country, and as this pamphlet is going through the press the last rail is being laid on another important line which joins the extreme northern portion of the lower peninsula to the railroad system of the United States. A glance at the map which accompanies this publication will reveal the importance of these two lines to the territory they intersect as well as to the State at large, and the magnitude of the great net-work of communications with which they form connections. Across the straits, and separated only by five miles of ferriage, a line is just opening which will traverse the upper peninsula to points where links will be formed with the great regions of the northwest. A more detailed description of the railroad system of the State is given elsewhere.

AN UNSTIMULATED GROWTH.

No organized effort has been made by the State to promote general immigration. Whatever means have been employed to invite population from abroad have been isolated and fragmentary. The growth of the State has been entirely natural and unstimulated. The result has been to make our people peculiarly homogeneous in character. New elements have been assimilated with marked success and rapidity. The natural resources and attractions of the State, however, have continued to draw people hitherward from other States and from Europe, until the population of forty-four years ago has increased nearly ten-fold. The territory which entered the Union in 1837 with 174,467 inhabitants of both sexes and all ages, sent to its defense less than thirty years later more than 90,000 soldiers. The State which stood twenty-third in rank in 1840 had advanced to the ninth in 1880. A table, based upon the returns of the United States census in each succeeding decade, tells the whole story:

Table Showing the Population of Michigan at each Federal Enumeration since the Admission of the State in 1837, with the Progressive Increase and Rank.

CENSUS YEAR.	Population.	Increase.	Rank.
1837	174,467	.....	.....
1840	212,267	37,800	23
1850	397,654	185,387	20
1860	749,113	351,459	16
1870	1,184,059	434,946	13
1880	1,636,331	452,272	9

THE STATES IT HAS OVERTAKEN.

In this stately march of forty years, Michigan has moved steadily past the older States of Maine, New Hampshire, Vermont, Connecticut, New Jersey, Maryland, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana and Tennessee. In 1860 it was outranked slightly by Wisconsin, and in 1870 by Iowa, but the census of 1880 showed that neither of those great and thriving States was then its equal in population. No State equals it now that did not, forty years ago, surpass it in the proportion of 80 per cent.

The distribution of the population of the State in 1880 over the several counties thereof is shown in the table which is printed on the face of the map at the beginning of this pamphlet.

WHERE THEY CAME FROM.

Of the total number of inhabitants of Michigan at the ennumeration of 1880, there were of native birth 1,247,989, and of foreign birth 388,346. The compilation of the returns of that census have not yet progressed far enough to exhibit their nativity in detail, and in the absence of that information the result of the preceding decennial inquiries may properly be reproduced. Of a total population of 1,184,059 in 1870, there were of native birth 916,049, and of foreign birth 268,010. The nativity represented was as follows:

Born in the United States.

Michigan	507,268	New Jersey	8,033
New York	231,509	Pennsylvania	28,507
Connecticut	7,412	Ohio	62,207
Maine	3,932	Indiana	12,140
Massachusetts	10,839	Illinois	6,055
New Hampshire	3,633	Wisconsin	5,986
Rhode Island	1,137	Other States	12,946
Vermont	14,445		
Total native			916,049

Born in Foreign Countries.

British America	89,590	Germany	64,143
England	35,051	Austria	795
Scotland	8,552	France	3,121
Ireland	42,013	Sweden	2,406
Wales	558	Norway	1,516
Holland	12,559	Denmark	1,354
Belgium	832	Poland	947
Switzerland	2,116	Elsewhere	2,457
Total foreign			268,010

THE FORMATION OF STATE CHARACTER, AND WHO FORMED IT.

The formative period in the character of the people of this State as a political community, and of their institutions, legislation and habits of action, was the decade between 1830 and 1840. It was during that time that they emerged from a territorial pupilage to assume the duties and responsibilities of an independent State. It was then they formed their first constitution, adopted their axioms and founded their traditions. The first convention which met to organize their fundamental laws was

composed of pioneers who, in the language of one of their few surviving members, were trying to work out the problem which continues to this day to be exemplified in the financial policy of the State, "earn your money before you spend it." The population of the territory at the beginning of this period was 31,639. When the ten years had elapsed it was found to have increased nearly seven-fold, its inhabitants numbering 212,267. The rate of increase had been 570 per cent. In no subsequent decade has it exceeded 92 per cent. This enormous accession was the element which stamped the civilization of the State. A large portion of it came from New England —most of it from the rural counties of New York—all of it bore the impress of genuine American thought and character. The institutions of the State, the nature of its laws, the ideas which control popular expressions and the tendency of sentiment which generally prevails, modified in their actual application by the enlarged conditions of a fresh and advancing society, as well as many of the names of its towns and villages, betray the origin of the element which is paramount in Michigan. The characteristics it introduced have never been lost. There have been large and welcome additions to the population of the State from many parts of this country and from most of the countries of Europe. They came to Michigan expecting to find a moral, intelligent and industrious American State, and they have not been disappointed. The process of assimilation has gone harmoniously forward, and no sectional or national distinctions disturb its citizens of either native or foreign birth. The prizes of business and political success are open alike to both, and even differences of language are lost after the lapse of a generation. But the fundamental sentiments and ideas which formed Michigan character nearly fifty years ago are respected still, and there are few among its people who desire a change.

GROWTH OF THE MANUFACTURING INTEREST.

The expansion of the manufacturing interest of the State is exhibited in the subjoined figures. They are taken from the Census Reports of 1850, 1860 and 1870, that for 1880 not being completed. All kinds of manufactures are included:

CENSUS YEAR.	Number of Establishments.	Number of Employes.	Capital Invested.	Wages Paid.	Value of Product.
1850	2,033	9,344	$6,563,660	$2,717,124	$11,169,002
1860	3,448	23,190	23,808,226	6,735,047	32,658,356
1870	9,455	63,694	71,712,283	21,205,355	118,394,676

INCREASE IN FARMING AND ASSESSED LANDS.

There were 34,089 farms in the State in 1850, in which were included 1,929,110 acres of improved land. The number of farms in 1880 was 118,941, comprising 10,977,105 acres, of which 6,217,209 acres were improved. "Compared with 1870," the Secretary of State said in his report of December 14, 1880, "the total area in farms has increased 866,974 acres, or 8.58 per cent. Of this increase 785,304 acres are in the counties north of the southern four tiers. The area of improved land in farms is 1,128,252 acres greater than in 1870, of which 552,460 acres are in the northern counties. In other words, in that portion of the State known as Northern Michigan, which is here taken to include all counties north of the southern four tiers, where ten years ago the total area in farms was only 1,923,550 acres, and the improved lands in farms only 411,217 acres, there is to-day an aggregate acreage in farms of 2,708,854 acres, and the improved land amounts to 963,677 acres." This was said nearly a year

ago. The increase in the number of farms and in the area of improved lands has been going forward with a strong impulse in the intervening period. The northern counties of the State are receiving large additions to their population constantly. A very considerable amount of land has been taken up for agricultural purposes in the upper peninsula, and the indications point to a more rapid settlement of all the northern portions of the State than ever before.

There were assessed for taxes in 1881, 29,306,820 acres. In 1861 the number of acres assessed was 15,162,710; in 1871 it was 20,515,388. The rate of increase during the last ten years has been more than 42 per cent. The total number of acres in the State, including the large extent of mineral lands on Lake Superior and more than 700,000 acres covered by inland lakes, is about 36,000,000.

AVERAGE SIZE OF FARMS.

The average size of the farms in Michigan is a fraction over 92 acres. The significance of this showing will be better appreciated in those countries of Europe where large land-holders engross most of the soil and the actual farmers are only tenants. Here a tenant-farmer is scarcely known. Whether large or small, the farmer's fields are his own. The exceptions are not numerous enough to note.

THE PRODUCTS OF A YEAR.

The natural products of the State in 1879—the latest year concerning which statistics are complete—were estimated by Gov. Jerome in his message to the Legislature at the beginning of 1881, to amount to a valuation of nearly one hundred and seventy millions of dollars, made up of the following items:

Agricultural products	$88,500,000
Timber	60,000,000
Copper	8,000,000
Iron	10,000,000
Salt	2,000,000
Fish	1,000,000

THE REALIZED WEALTH OF THE STATE.

The Constitution of 1850 required the Legislature to provide "for an equalization by a State Board in the year 1851 and every fifth year thereafter, of assessments on all taxable property except that paying specific taxes." The statements made by this board at each successive meeting indicate the progressive increase in the amount of taxable property. The valuations it has established during the 30 years of its existence have been as follows, the figures representing both real and personal estate. An extra session was held in 1853 by direction of the Legislature, to revise the action of 1851:

1851	$30,976,270
1853	120,362,474
1856	137,663,009
1861	172,055,808
1866	307,965,842
1871	630,000,000
1876	630,000,000
1881	810,000,000

The general depression prevailing throughout the business of the country between 1873 and 1876 caused large depreciation in the values of many kinds of property, and left the valuation of 1876 the same as that of 1871. During the last five years the mining and navigation interests have revived, pine lands have increased in value, manufactures have largely extended their scope, real estate has enhanced its prices,

and business of all kinds has attained an unprecedented prosperity. The advance of nearly 30 per cent in the valuation of taxable property in that period fairly represents a legitimate growth.

A very large amount of the property of the State is excluded from its assessed valuation. All the railroads, aggregating over four thousand miles in length, with their rolling-stock, machine-shops and other accessories, and some other corporations, pay taxes at specific rates, and are out of the scope of the assessment officers. All houses of public worship and cemeteries; the personal property of all library, benevolent, charitable and scientific institutions, and such real estate as they may actually occupy; the public property of counties, cities, villages, townships and school districts actually used for corporate purposes; property of the State and of the United States, including unoccupied lands; land grants made to promote public communications (for limited terms), and liberal allowances of household goods, are exempt from taxation. It was the estimate of Gov. Croswell in his last message to the Legislature, January, 1881, that including the interests which pay specific taxes and those which are exempt from taxation, the aggregate property of the State was not less than Twelve Hundred Millions of Dollars..

LABOR AND ITS INDUCEMENTS.

There is nothing in either the soil or the climate, or other natural advantages of Michigan, which exempts those who settle in the State from the common conditions of success in every part of the world. If a man without means chooses to lead an idle and thriftless life, he can starve to death here as soon as any where else. But there is no portion of the Union, either in the States or territories, which offers larger encouragement to industry and economy. The laborer, seeking employment with an honest desire to earn a living, and willing to render a fair day's work for a fair day's wage, can always, under ordinary business conditions, find something to do for which he will be well paid. A few years of labor and frugality, in which steadiness and growing experience will, as in every other pursuit, enhance from year to year the value and compensation of his services, will ensure savings enough to buy land. If he has chosen one of the newer sections of the State for his residence he may readily secure a farm in the neighborhood to which he has become accustomed, at low prices and on easy terms, and the same qualities which gave him a start will establish his prosperity and independence on a sure and enduring basis.

It is not alone the work of the farm that affords openings to labor. The mines, furnaces, lumber camps, mills, manufactories and mechanic arts of the State, continually increasing in number and variety, furnish a growing and diversified demand for every kind of employment that a man can pursue either with his head or his hands. And there is no region on earth where brains and muscle can work more advantageously together.

THE INDUSTRIES OF MICHIGAN.

Although agriculture is the chief producing interest of this State, and engages the attention of the largest share of its people, fertile farms and prolific orchards have not alone contributed to its prosperity. Noted for its wheat, its wool and its fruit, it is also the first of the United States in its production of lumber, salt and copper, and in the extent of its fresh-water fisheries, second in its yield of iron ore, and among the most advanced in its general manufacturing and commercial development. While a few States excel it in the volume of their crops, and some in the aggregate of their industrial statistics, none can equal it in the magnitude and diversity of its resources, taken together. Its forests, mines, mills and factories, while offering employment to all grades of labor, from the unskilled worker with the pick and shovel to the most expert mechanic, also create a large and constant local demand for the farm products of the State, and thus doubly promote the general progress. The full extent of the invitation Michigan thus proffers to the laborer and the artisan in search of work and to the farmer of small means who desires to purchase new lands and to secure a home market for his surplus produce, can be best made plain by brief accounts of the history and condition of its leading industries.

LUMBER.

Before the axe of the lumberman commenced its work on the forests of Michigan, the northern part of its lower peninsula surpassed any known region of the same area in the richness of its stock of timber. Interspersed with the best varieties of pine were extensive growths of oak, maple, beech, ash, walnut, cherry, whitewood, hickory and elm, while the less valuable cedar, hemlock, basswood and tamarack grew, in some sections, in equal abundance. In the upper peninsula pine existed also in large quantities, and broad tracts of hard wood invited the erection of furnaces for the manufacture of the best grades of charcoal iron. Magnificent forests of hard timber covered the greater part of the southern counties, now so rich in agricultural wealth. A more comprehensive account of the timber resources of the State is printed on succeeding pages, from the pen of Prof. W. J. Beal, the accomplished botanist of the Agricultural College.

Much of the timber product of the State has been of an exceedingly superior quality. Its cork pine ranks among the best of the soft woods, and commands the highest market price. Its common grades of white and Norway pine are of standard value, while its harder woods are in demand in the ship-yards, factories and cabinet shops of this and the European continent. Two-thirds of the best lumber sold in the markets of New York, Philadelphia and Boston goes from its mills, which also supply the heavy building demands of this and neighboring States, especially the prairie States; and it exports annually to foreign countries large shipments of hewn oak and pine timber, staves, and veneering stock.

THE CHIEF MANUFACTURING INTEREST OF THE STATE.

For more than a score of years lumbering has been the chief manufacturing interest of Michigan, and no American State equals it at the present time in the extent and value of its lumber product. The State has never collected and compiled the annual

statistics of this industry, and the most trustworthy sources of information upon the subject are the elaborate publications of journalists connected with papers representing that interest, or issued at the centers of the manufacture. Even these are deficient in statistics covering the trade in spars, staves and long timber, and the thousands of cords of fuel chopped and sold annually have gone unrecorded, as also have the heavy shipments of railroad ties, cedar telegraph poles, piles, paving blocks, and hard woods for the furniture maker. But since 1863 the statistics of the manufacture of pine into lumber, lath and shingles have been gathered with intelligence and thoroughness.

ITS GROWTH AND MAGNITUDE.

The history of this great industry covers a period of only about thirty years. In 1854 the Hon. Wm. L. Webber, of East Saginaw, made the first estimate of the extent of the operations of Michigan lumbermen, whose activity was then chiefly confined to the valley of the Saginaw river. He reported the existence of 61 mills, many of them using water-power, and placed their entire annual product at but 108,000,000 feet. Eighteen years later, in 1872, it was estimated that the lumber product of Michigan for twelve months included 2,560,000 feet of oak timber, 12,700,000 staves, 300,000,000 lath, 400,000,000 shingles, and 2,500,000,000 feet of sawed pine. The number of saw-mills in the State at that time was about 1,500, employing more than 20,000 persons, and representing $25,000,000 of capital. There were also 200 shingle-mills and 80 stave and hoop factories with an annual product of $4,000,000 in value. The lumber trade suffered materially, however, during the following years of commercial depression, but in 1879 the total amount sawed in this State reached 3,100,000,000 feet, and Gov. Jerome in his inaugural message estimated the value of the entire timber product of that year at $60,000,000. The product of 1880 is placed on good authority at 3,800,000,000 feet of sawed lumber and 2,425,000,000 shingles, besides lath, staves and long timber. An ingenious calculation shows that the work of the Michigan mills during that year in sawed lumber would load a train of cars 2,375 miles in length, each car carrying 10,000 feet and occupying 33 feet of track, and would build a city of handsome frame houses capable of furnishing comfortable homes for a million of people. The aggregate value of the forest products of this State already marketed is largely in excess of $800,000,000. These totals far outstrip those of any other timber-producing State, or of any country of like area.

FACILITIES FOR TRANSPORTATION.

The numerous lakes, rivers and small water-courses which form such salient features in the topography of Michigan have been and are of inestimable value to many interests, but to none more than those of the lumberman. They have borne myriads of logs from the forests along their banks to the booms of mills located at convenient shipping points, and this economical transportation has added millions to the profits of the business and greatly aided its remarkable development. Within a few years the disappearance of the valuable pine along some of the streams and the necessity of access to the remoter tracts of timber have led to the construction of small logging railroads in many portions of the lower peninsula, which possess an aggregate length of many miles, although they are not all of them incorporated under the general railroad law. In all instances, it is believed, they have proved profitable.

EFFICIENCY OF THE MILLS.

Many of the lumber mills of the State are unequaled in their capacity and in the completeness of their equipment. One of them, on a trial of speed, sawed 180,000 feet in three working hours, and some of them will cut 150,000 feet per day. At this time the usefulness of the electric light is being carefully tested, in the hope that it may prove possible to generate it with the mill machinery.

DIVERSITY OF LABOR EMPLOYED.

A brief description of the methods of lumbering followed in Michigan will illustrate the diversity of labor employed by that interest. The felling of the trees is the work of the winter, when snow-clad ground and frozen streams facilitate the transportation of supplies into the forest and the hauling of logs. Camps are pitched at convenient points in which the axemen and teamsters live during the chopping season, the abundance of material making the construction of comfortable quarters easy and economical work. The cut timber is carried on sleds to the banks of some convenient stream or to the track of a logging railroad. In the latter case it is taken to the mill on flat cars, as needed, or transported to the shore of the great lakes and rafted, uncut to ports hundreds of miles away. In the former instances the high water and strong currents of the spring freshets are used to carry the logs down the streams to points where it is possible to ship lumber to other markets by rail or lake, and where, as a consequence, the mills will be found. There the logs are received and secured in strong booms, controlled by local corporations, the managers of which attend to their delivery at the private booms of their owners, whose property is easily designated by their special marks. Sawing, yarding and shipping require the labors of other and distinct classes of workmen.

THE GREAT CENTERS OF MANUFACTURE.

The distribution of the lumber manufacture of Michigan is determined by its rivers and railroads. Below the valleys of the Saginaw and the Grand, little else than a mere local trade now exists. The Saginaw receives the waters of the Tittabawassee, the Cass, the Flint, the Shiawassee, the Bad, and their numerous tributaries, draining a vast and magnificently timbered region. At its mouth are the thriving towns of Bay City and West Bay City; sixteen miles above, and at the head of steam navigation, are Saginaw and East Saginaw. At these cities and in the flourishing villages between them are collected the finest lumber manufacturing establishments in the world, whose total yearly product surpasses that of any other single district. The river which brings the logs to their booms also bears large vessels to their docks, and they have under absolute control all the advantages of cheap water transportation. The Saginaw valley is also connected by several first-class lines with the railway system of the continent, and with this multiplied outlet commands access to all the markets of the world.

The Lake Huron shore, including Saginaw Bay, counts its saw-mills by the hundred. The Au Sable and Thunder Bay are important logging rivers of that part of the State, and lumbering is also extensively carried on along the Rifle, the Aux Gres, the Cheboygan, the Black, and many smaller streams. Alpena, Tawas City, East Tawas, Cheboygan, Oscoda, Au Sable, Harrisville and Black River are important manufacturing or shipping points.

The chief lumbering rivers emptying into Lake Michigan are the Muskegon, the Manistee, the Grand, the White and the Pere Marquette. Many millions of feet are also cut annually along the banks of the Kalamazoo, the Paw Paw, the Grand Sable, the Aux Becs Scies, the Pentwater, and other lesser streams. The Muskegon, after draining a broad valley extending far into the interior, expands into a handsome lake close upon the shore of Lake Michigan. No natural provision could be more favorable for the handling of logs and the shipment of the sawed product, and the city of Muskegon, located upon the south shore of the lake, has the distinction of annually cutting more lumber than any other single city in the world. Manistee possesses a similar eminence in the manufacture of shingles. Benton Harbor, St. Joseph, Grand Haven, Spring Lake, Saugatuck, Montague, Whitehall, Pentwater, Ludington, Frank-

fort, and Traverse City, also contribute to swell the total of the forest products of the Lake Michigan shore.

There are many inland towns, situated upon railway lines, which are important centers of this industry; among them are Flint, Lapeer, Evart, Big Rapids, Cadillac, Midland and Farwell.

Lumbering is yet in its infancy in the upper peninsula, but the value of the sawed and square timber product of that region in 1880 was almost $4,000,000. Saw-mills are scattered along the shores and the railways of Menominee, Delta, Mackinac, Marquette, Schoolcraft, Baraga, Houghton and Ontonagon counties, but the chief centers of lumber production in that section of the State are Menominee, Escanaba, Manistique, St. Ignace, Ford River and Munising.

STATISTICS OF THE TRADE.

The statistical aspect of the lumber interest in Michigan is presented in the subjoined table:

Lumber and Shingle Product for 1880 of the Most Important Districts in Michigan.

LOCATION.	Lumber, Feet.	Shingles, Number.
Upper Peninsula	350,000,000	100,000,000
Lake Michigan:		
Manistee	197,050,311	440,469,000
Ludington	118,377,297	56,707,000
White Lake	91,451,458	47,245,000
Muskegon	591,201,649	58,003,000
Spring Lake	135,919,658	168,000,000
The Saginaw Valley	862,453,000	241,075,160
Lake Huron shore	286,583,000	57,938,000
Interior Mills:		
Chi. & West Mich. R. R.	53,830,000	66,292,000
Grand Rapids & Indiana R. R.	174,785,000	186,581,000
Detroit, Lansing & Northern R. R.	71,530,000	97,049,000
Flint & Pere Marquette R. R.	92,681,000	152,350,000
Michigan Central, Mackinac & Bay City Divisions	68,275,000	40,428,000

[This table does not include returns from scattered mills or from points of minor importance.]

THE LUMBER BUSINESS OF THE FUTURE.

The impression that Michigan is showing signs of exhaustion as a timber-producing State is without adequate foundation. Careful observers estimate that its forests still contain forty-five billions of feet of good pine, exclusive of the smaller growths which will become marketable as the larger trees disappear. The value of the vast quantity of other timber covering its woodlands can only be expressed in enormous figures. Even for the cedar and hemlock, which are so abundant, there is a steadily increasing demand, while the stock of hard woods must, in the future, prove the source of great wealth. By some well informed lumbermen it is believed that ultimately the hard wood product of Michigan will approach in yearly value the generous figures that now represent the gross earnings of the pine lumber trade. Certainly the time is not far distant when hard wood saw-mills must become common, and the innumerable industries into which such timber enters must rapidly multiply. For years to come Michigan will keep its rank as the great timber-producing State, and this interest will continue to furnish profitable investments for capital, remunerative employment for the laborer, and a sure home-market for the produce of the pioneer farmers.

SALT.

Long prior to the settlement of Michigan by white men, the Indians supplied themselves with salt from the saline springs of the Saginaw valley, and those who conducted the early topographical and geological surveys of the State predicted that systematic exploration would reveal the existence of subterranean stores that might be developed into great commercial importance. Spasmodic attempts to manufacture salt were made even under the territorial government, but without success.

DEVELOPMENT AND GROWTH OF THE SALT INTEREST.

Shortly after the State was organized its legislature made a series of appropriations to meet the expenses of a thorough examination of its saline resources by Dr. Douglass Houghton. His work was valuable in many respects, but did not yield conclusive results, and for five years after his death the subject received but little public attention. Private enterprise, stimulated at the outset by a small State bounty, finally added salt to the staple products of Michigan. In 1859–60, the East Saginaw Salt Manufacturing Company sank a well at that city to the depth of about 650 feet, and was the first to obtain brine in paying quantity and quality. Thenceforward the development of this industry was rapid and decisive. Greater progress was made by it in four years than was made in the Kanawha valley in fifty, and in five years its product equaled that reached by the Onondaga salt springs of New York in the forty-second year of the existence of the works near Syracuse.

THE LARGEST SALT-PRODUCING STATE.

Of late the Michigan product of salt has largely exceeded that of any other State, and in 1880 it nearly equaled the entire annual salt yield of the United States when its manufacture first became successful on the Saginaw. The inaugural message of Gov. Jerome gave these statistics of the present condition of this important interest, derived from the official report of the State inspector: The salt-producing territory of Michigan as now developed covers over 8,000 square miles; the total number of salt blocks is 119; the product inspected in 1880 was 2,676,588 barrels; their annual capacity is 3,000,000 barrels, and their number is rapidly increasing. The amount of salt inspected in 1880 was about 30 per cent larger than that of the previous year. The extent of the basin from which the brine is taken is yet unknown, "but it is fair to presume that the supply is inexhaustible, and the increase in manufacture will continue as the demand increases with the growth of the great West."

STATISTICS FROM THE CENSUS OF 1880.

From the comparative statement of the salt industry of the United States for the census year 1880, published by the National Census Bureau, August 8, 1881, these statistics of the principal salt-producing States are taken. It will be seen that the value of the product in this State was nearly double that of New York, while the capital employed was nearly $140,000 less.

Principal Salt Products of the Census Year 1880.

STATES.	Value of Product.	Average Strength of Brine.	Average No. of Employes.	Wages Paid.	Value of Materials Used.	Capital Invested.
Michigan	$2,271,913	91¼	1,268	$540,902	$1,009,733	$2,147,209
New York	1,106,740	69½	1,010	274,087	507,120	2,286,081
West Virginia	380,369	35⅝	736	160,227	192,113	909,500
Ohio	363,791	36 4-5	451	105,261	202,543	832,600
Pennsylvania	177,415	28	137	52,047	74,047	234,500
Virginia	127,678	86	76	14,219	39,000	1,000,000
California	121,950	.....	184	49,120	18,495	365,850

CHEAP TRANSPORTATION AND ECONOMICAL PRODUCTION.

The preëminence of Michigan as a salt-producing State is due to a combination of causes. The abundance and superior strength of its brine does not alone explain it; neither does the fact that careful inspection by State authority through a series of years has, as a rule, kept its salt unsurpassed in chemical purity and in preserving qualities. The fortunate location of the wells upon the shores of navigable waters has given this industry the advantages of cheap transportation and easy access to markets in all the central and northwestern States. Still more important is the economy with which the salt blocks are worked. In connection with saw-mills their operation involves a large saving of expense. Power is furnished by the same engines; the evaporation of the brine is forced, during the day, by the exhausted steam from the mills, and during the night by live steam generated in the boilers by burning the refuse slabs and sawdust; and the barrels are made of staves cut from the rejected lumber and slabs. By this system a superior salt is obtained at a minimum cost of manufacture. The same advantages cannot fail to accrue to the salt trade of the State in its competition with other States hereafter.

CHIEF CENTERS OF MANUFACTURE.

The chief center of the salt manufacture is the Saginaw river, and the blocks on its banks produce nearly five-sixths of the entire yield of the State. There are also paying wells at Caseville, Port Crescent, Port Austin, New River, Port Hope, Sand Beach and White Rock, in Huron county; at Oscoda, East Tawas and Tawas City, in Iosco county; at Midland and at Manistee. The latter is the pioneer district of the Lake Michigan shore, and has been developed within the last year.

HOW IT IS MADE AND WHERE IT IS SHIPPED.

No rock salt has been found in the State, and the brine is procured by boring deep wells and pumping. The salt is obtained by evaporation, and steam is mainly used for this work, although the solar process is employed by a few companies. All the product is carefully inspected and branded by officers appointed by the State, and the purity of the brine and the perfection of the methods of manufacture are such that the yield of 1880 did not contain two per cent of second quality salt. The bulk of the Michigan salt is shipped to Chicago, but it also finds distributing points at Milwaukee, Racine, Duluth, Detroit, Toledo, Sandusky, Cleveland, Dunkirk, Erie, St. Louis, Cincinnati and Hannibal, Mo. Within the last year it has been shipped by rail in considerable quantities.

WHERE THE BRINE COMES FROM.

The reservoir of Michigan brine is a series of sandstones and shales, from 1,000 to 1,200 feet in thickness, called by geologists the Waverly group. It is a sea-coast rock, in which the prints of sea-weeds and the fossil remains of enormous marine growths are found, and is saturated, sponge-like, with the brine. Presumably centuries ago the waves of a pre-Adamite ocean broke upon that shore, and impregnated it with its saline riches.

The average depth of the Saginaw wells is about 900 feet. Productive wells have been sunk elsewhere to distances ranging from 1,000 to 2,000 feet, and they indicate other brine-carrying basins belonging to another group which will reward deeper borings. The brine is easily pumped, and the yield of the wells varies from 12 to 20 gallons per minute. A single well has yielded 26,000 barrels of salt in a manufacturing season of eight months, and the annual product of some companies has reached 80,000 barrels.

READY MARKETS AND GENERAL USE.

The best qualities of Michigan salt sell promptly for dairy and family use, and are

especially adapted to the wants of packers of meats and fish. The inferior grades are branded as such and sold for salting stock and hides and similar purposes, while an increasing market has opened for refuse salt as a fertilizer. Shipments in bulk and in sacks have recently begun. The bitter waters which are drained off in the processes of manufacture contain valuable ingredients; the bromine of pharmacy and the arts is now largely obtained from this source.

A PERMANENT SOURCE OF WEALTH.

The salt interest of Michigan can be safely pronounced a permanent source of wealth. Subterranean explorations are being made in widely scattered parts of the lower peninsula—in Berrien, Gratiot, Muskegon, Alpena, Cheboygan and other counties—with promising prospects. Under a general enabling act passed by the last Legislature, an underground pipe-line nine inches in bore and twelve miles in length is being laid between the salt wells of East Tawas and the lumber mills of Oscoda; it is expected that it will supply brine enough for the daily manufacture of 1,000 barrels of salt.

The development of this great interest is yet very far from its maturity.

On the 1st of October, 1881, fine salt was selling at the chief points of manufacture on the Saginaw at $1.05 per barrel.

COPPER.

The early descriptions of Lake Superior likened that monarch of fresh-water seas to a bent bow, partly across which, in the similitude of a broken arrow, stretched the long and narrow Keweenaw Point. The backbone of that peninsula is a picturesque mountain range of trappean rocks, possessing an average elevation of 600 feet above the lake level, but rising in occasional peaks to double that hight. This Mineral Range, whose northern and western slopes, as a rule, closely skirt the lake shore, has a length of 150 miles, varies from four to seven in width, and is flanked on the east and south by a comparatively low and level country. It contains the richest copper mines ever discovered, which yield four-fifths of the entire product of the United States, not in the form of an ore but of a virgin copper, almost chemically pure as it lies in the vein and ready for the market when freed from its rocky matrix. This copper is distributed through the rocks in three forms, viz.: In immense masses, or in ragged, root-like pieces called "barrel-work," or in small scattered particles known to miners as "stamp stuff." It is mined by means of deep shafts and connecting galleries, and when brought to the surface is separated from the rock by being first washed under the ponderous hammers of the stamp mills and then subjected to the fires of the smelting furnace. The product is placed on the market in ingots, cakes, bolts and bars, is sold both in Europe and India, and commands the highest price at home and abroad. In tenacity it surpasses all other coppers, and from this fact it is sought for by the cartridge works of all great military powers.

COPPER MINING ON LAKE SUPERIOR.

The history of Lake Superior copper mining has been a series of geological surprises. Originally it was not believed by scientific men that pure copper could be taken from the earth in profitable quantities. Ultimately, however, huge masses of native metal were found in the Mineral Range in veins crossing at varying angles the prevailing strata of the mountain formation; they seemed to fill immense cracks penetrating the general rock system, and hence received the name of fissure veins. The

first successful mine, the Cliff, was located upon one of these fissure veins, and they at once became the object of eager search by the prospectors. A little later other veins were found running with and not across the strata, and one of these yielded the then unsurpassed product of the Minesota, the mining wonder of the years from 1855 to 1862. At about this time rich deposits of copper, not in masses but in small particles, were also discovered in the amygdaloid rocks which belong to the general mountain system, and are technically called "lodes." The original theory that the fissure veins were alone copper-bearing was in the face of these discoveries permanently discarded. Twenty years ago the belts of tough conglomerate were considered valueless for mining purposes, yet, since 1870, the Calumet and Hecla has been annually taking from the conglomerate of its location many more tons of copper than the yearly product of the entire peninsula prior to the date of its opening.

That copper existed on the shores of Lake Superior has been known for two centuries. The fact is mentioned in the journals of the early explorers and preserved in the traditions of the Indians. Abundant and interesting traces of ancient mining have been found on Keweenaw Point and Isle Royal.

EARLY PAYING MINES.

It is now forty years since Dr. Douglass Houghton, whose name is lastingly and most honorably identified with the history of northwestern development, presented to the Legislature his report upon the geology of the upper peninsula, the product of ten years of persistent and thoroughly scientific labor in an unbroken wilderness. It first asserted that the mineral wealth of the southern shore of Lake Superior offered a profitable field to enterprise and capital, and placed on record prophecies as to copper since amply fulfilled. Numerous exploring parties were soon busy on the Mineral Range, and in 1846 the fissure vein of the Cliff mine, near Eagle river, was yielding a remunerative product, the regularity of its dividends for many years proving a source of constant encouragement to struggling enterprises along the peninsula. Two years later the Minesota commenced work, back of Ontonagon, upon the enormous masses of copper, one of them about five hundred tons in weight, which made it the bonanza mine of the day. Exploration was eventually pushed to Portage lake, and the district to which it gives its name is now the busiest center of the copper-mining interest as well as the most prosperous. The lake forms a spacious and accessible harbor, open by costly water ways to the largest vessels navigating the lakes, upon which lie the flourishing towns of Houghton and Hancock. Both shores of the Keweenaw peninsula are connected by this harbor and its inlets, and supplies for the mines as well as their products find easy transportation through the facilities thus afforded.

THE RICHEST COPPER MINE IN THE WORLD.

About 1865 the Calumet conglomerate was discovered 12 miles from Portage lake, and the annals of mining enterprise contain no parallel to the history of the consolidated company now known as the Calumet and Hecla. With a total assessment for all purposes upon its share-holders of less than $1,000,000, it has built up a vast industry employing over 2,000 men, supporting two flourishing villages with a population of more than 5,000; has expended a vast amount of money in stamp-mills, machinery and permanent improvements, and possesses a dividend account which has already reached the magnificent total of twenty millions of dollars. More than one-third of the entire copper product of the upper peninsula has been taken from its levels. No mine, of any description, has ever returned such large *pro rata* dividends to its share-holders. The great Burra-Burra mine of South Australia did not yield, during the twenty-one years of its profitable existence, as much pure copper as was taken from the Calumet and Hecla in 1879 and 1880. It pays quarterly dividends of $5 per share on 100,000 shares, with great regularity, and its stock, the par value of which is $25,

is quoted at the present time (Oct. 1, 1881,) at $225. Its total product of refined copper in 1880 was a fraction less than 15,838 tons.

PROFITABLE MINING—COMPARATIVE PRODUCT OF PRECIOUS METALS FOR SIX MONTHS OF 1881.

At the close of 1880 the Lake Superior copper districts had produced 301,054 tons of refined copper, valued at $142,616,137. The total output of that year was 24,869 tons, valued at $9,947,673, which was taken from thirty mines. The production of 1881 will surpass that of any previous year. A paragraph which appeared in an upper peninsula newspaper stating that "the net earnings of the Lake Superior copper mines for the first half of the year 1881 exceed those of any precious metal mining State or Territory in the Union," was submitted for verification to eastern mining authorities, and elicited in reply the following statement, fully substantiating the assertion of the newspaper referred to. The figures given show the net earnings of the gold, silver and copper mines of the States and Territories embraced in them for the first six months of 1881:

California	$998,000	Colorado	$962,000
Nevada	791,250	Montana	240,000
Utah	375,000	Georgia	8,000
Arizona	900,000	Michigan	1,410,000
Dakota	560,000		
Total			$6,244,250

THE COPPER DISTRICTS OF MICHIGAN—THE CHIEF SOURCE OF THE WORLD'S SUPPLY.

The copper mines of Lake Superior form four districts, viz.: the Ontonagon, located at the base of Keweenaw Point, and yielding now but small returns; the Keweenaw, covering the northern extremity of the Point, and containing the rich fissure veins; the Portage lake, with the great productive mines; and Isle Royal, a narrow rocky island near the north shore of the lake. Copper and copper ore have been found elsewhere, but not in sufficient quantities to invite systematic mining. Thriving towns have clustered about the mining locations; two capacious ship canals aid in the transportation of their product and of supplies; and the day is not far distant when the now isolated Mineral Range railroad will be connected with the great railway system of the continent. The machinery which facilitates the subterranean work in the larger mines, handles the mineral and crushes the tough rock, is not surpassed in force and ingenuity of design by that of any mining country. The introduction of the electric light into the mine levels is now projected, and labor-saving invention in this industry is certain of prompt rewards. The upper peninsula is, at present, the chief source of the world's supply of copper. Its product has for some years exceeded that of the mines of Chili, and is far greater than the present yield of the famous Cornish mines of England, or of the mines of Australia or continental Europe. At this time the industry is in a most flourishing condition. The prospects of the future are described in the extract which is here subjoined from the first report of the State Commissioner of Mineral Statistics:

"Mining in the copper rocks of Lake Superior must be regarded as in its infancy. Not one thousandth part of the trappean or copper range is known or has been minutely explored. The mines of Cornwall have been worked for a thousand years, new discoveries having been made as old ones were exhausted. No one who has paid any attention to the developments in this region can doubt for a moment that a great, profitable future lies open, and that centuries hence the copper mines will be worked by a populous, intelligent and prosperous community, educated in our common schools and mine colleges, and made happy by the perpetuated blessings of civil and religious liberty."

IRON.

The discovery of the valuable iron ore deposits was not due to the narratives of early travelers, nor to geological exploration, but was the unforeseen result of the eager search for copper which followed Dr. Houghton's report of 1841. That paper merely said: "Although hematite ore is abundantly disseminated through all the rocks of the metamorphic group, it does not appear in sufficient quantity at any one point that has been examined to be of practical importance." In 1844 the attention of the United States surveyors who were at work about the present site of the city of Negaunee was drawn by the unusual variations of the needles of their solar compasses to outcroppings of magnetic iron ore. In the next year the agents of a copper mining company, which had been formed at Jackson, explored the same region, and becoming convinced that iron ore of merchantable quality was present in large quantity, secured what is now known as "the Jackson location." The first ore, three hundred pounds, was taken from this mine in 1846, and was smelted in the following winter in an old forge on Cucush prairie. The first iron made upon Lake Superior was in 1848, near Carp river. In 1849 the first opening was made at the location of the Cleveland mine, near Ishpeming, and in 1850 a few tons of ore were taken to Newcastle, Pa., and made into bloom and bar iron, the quality proving excellent. In 1852 seventy tons of the Jackson ore were manufactured into pig iron at Sharon, Pa., and the attention of iron-masters in Pennsylvania and Ohio was then more generally drawn to this new field of supply.

THE SAULT STE. MARIE CANAL.

It was in 1852 also that Congress granted to Michigan 750,000 acres of land to aid in the construction of a canal around the rapids of St. Mary's river, which was accepted in the following February, and a contract was promptly executed with an association of eastern capitalists who pushed on their task with vigor in the face of many obstacles. As a result the State, in 1855, threw open to lake commerce the Sault Ste. Marie Ship Canal, a magnificent enterprise, representing an original outlay of $1,000,000. It has been of vast benefit in developing the great industries of the upper peninsula. Within the last ten years it has been materially enlarged by the general government, to which it has been ceded by the State on condition that it shall be kept as a free national highway. With the opening of this canal commenced a new era in the mining history of Lake Superior. It was now possible during the season of navigation to readily reach a base of supplies and a market, and the growth of the country became rapid and constant.

VIGOROUS MINING.

In 1855 the shipments of ore began, and the unprofitable mine bloomaries were abandoned. In 1858 the first furnace (the Pioneer) commenced operations. In 1860 the entire ore product of the district exceeded 100,000 tons, and by this time all doubts as to the value and permanence of its mining interest had disappeared. New enterprises followed in quick succession, cities and villages sprang up and thrived, a railroad connecting the mines with lake ports and then with the great northwestern lines was built, and the work of exploration was vigorously pushed in every direction. Even the prostration of the iron industry of the United States by the panic of 1873 only retarded this development. In 1880 the producing iron mines of the upper peninsula were fifty in number, and they yielded 1,955,746 tons of ore, the value of which was $17,309,675.

THE PRODUCT OF THE MINES.

The pig metal produced by the upper peninsula furnaces during the year 1880 had an approximate market value of $1,941,000, and the value of the total output of the

Lake Superior iron mines for that year was about $19,500,000. The aggregate product of these furnaces and mines between the date of the Jackson discovery and the close of the last calendar year was more than $118,000,000. The product of 1881 promises to exceed 2,000,000 tons in amount and $20,000,000 in value.

THE IRON DISTRICTS OF MICHIGAN.

The upper peninsula contains three iron districts, viz.:

1. That of Marquette, which includes the most thoroughly developed mines, and substantially embraces the counties of Marquette and Baraga. Its chief mines are located in the hills west of Marquette and between or about Negaunee and Lake Michigamme, and are reached by the Marquette, Houghton and Ontonagon railroad and its branches. There is also a detached group of openings south of Marquette, on the headwaters of the Escanaba river, and near the line of the Chicago and Northwestern railway. This region contains the flourishing cities of Marquette, Negaunee and Ishpeming, the centers of much business activity, and communities of enterprising and intelligent people, well provided with hotels, schools and churches. Near the principal mines there are also thriving villages. The district has been connected by rail for some time past with the ports of Marquette and L'Anse on Lake Superior and Escanaba on Lake Michigan, the harbors of which contain huge ore docks where vessels of the largest class sailing on the lakes can be loaded in a few hours. The completion of the Detroit, Marquette and Mackinac railroad adds St. Ignace, on the straits of Mackinac, to the important shipping points of the upper peninsula.

2. The Menominee district, located in the northern and western towns of the county of that name, and near the Menominee river. The presence of ore in that region has been known since 1867, but active mining operations have been prosecuted there on any considerable scale for only five years. It contained in 1880 fifteen producing mines, which yielded in that year 600,000 tons of ore, and had reached a development greater than that attained by the Marquette mines in the eleven years following their first shipments. This district is reached by the Menominee River railroad, connecting with the Chicago and Northwestern line, and delivering its ore at Escanaba. During the present year the road will be extended a few miles further towards the northwest into Marquette county, and a branch is being constructed which will open what is known as the Felch mountain district, on the boundary of Menominee and Marquette counties. Seven mines in that region are ready to commence shipments as soon as the rail is laid. Explorations are being pushed in the Menominee district with promising results.

3. The Agogebic district is located between the lake of that name in the centre of Ontonagon county and the Montreal river, which forms the extreme western boundary of the State. It is wholly undeveloped as yet, but is being carefully explored under the supervision of the State Geological Board. There are satisfactory indications of the existence of rich stores of mineral wealth, and large quantities of land in that region have been sold with a view to explorations during the season of 1881 by the United States Land office at Marquette.

MANAGEMENT OF THE MINES.

For many years the Lake Superior ores were quarried from the rich deposits just beneath the surface, and the openings were, in fact, huge pits. Since 1870 underground working has been resorted to by the larger mines, and their mineral is now reached by subterranean shafts and levels, and is broken up and handled by the usual methods and machinery. The corporations which have developed and manage this industry represent capital invested with legitimate business aims, and their affairs are, as a rule, guided with signal skill and enterprise.

MINING ON A LARGE SCALE.

Of all American mines of its class the Jackson has been the most prosperous. The Menominee Mining Company, owning six developed mines and much undeveloped territory, is pronounced by Mr. A. P. Swineford, who has given more intelligent attention to this subject than most men, to be the largest ore producer in the world. The Republic is unquestionably the greatest iron mine in existence. It contains the largest single iron ore pit of which there is any record; its openings are numerous and skilfully planned, and it has elaborate machinery. It gives employment to more than 500 men, affords support to a village of 2,000 inhabitants, and ships over 300 car loads of ore daily during the season. There are other mines not much behind the Republic in magnitude, and fully equal to it in the practical completeness of their appointments.

TENACITY OF MICHIGAN IRON.

The Michigan ores are of extraordinary richness; sixty-two and nine-tenths per cent of metal is given by the State Geologist as the average percentage of first class ores, while the furnace books very often show a higher yield. In Pennsylvania fortunes have been made in mining forty per cent ores. The Lake Superior iron ranks as a standard metal in the markets. Its tenacity is very marked, and in a test of bar iron made some years ago, and reported in the columns of the New York Engineer, it bore the following comparison with the products of other States and countries:

IRON—WHERE FROM.	Strength per lb., Square inch.
Salisbury, Ct., by means of 40 trials	58.009
Sweden, by means of 4 trials	58.184
Center Co., Pa., by means of 15 trials	59.400
Essex Co., N. Y., by means of 4 trials	59.962
Lancaster, Pa., by means of 5 trials	58.661
Russia, by means of 5 trials	76.069
Carp River, Lake Superior, by means of 1 trial	89.582

REDUCTION OF THE ORE.

The greater part of the ore mined in the upper peninsula is shipped in its natural condition and reduced into iron by the coke and anthracite furnaces of other States. The furnaces of Michigan as a rule use charcoal and produce a superior quality of pig metal. They are located near large tracts of hard wood, and depend for their prosperity upon the abundance of that supply of fuel. The building of new railways in the upper peninsula has opened immense tracts of charcoal timber which have been hitherto inaccessible, and an extensive revival in the manufacture of charcoal pig-iron in that region is confidently expected. The production of charcoal gives employment to a large amount of labor, and it can be pursued at a season when other labor is suspended.

THE BLAST FURNACES AND THEIR PRODUCT.

In Mr. Swineford's book on "Iron Mining," etc., in the upper peninsula, he names seven furnaces in blast during the year 1880—five of them lying in Marquette county, one in Menominee, and one in Delta,—whose product of pig metal was 48,523 tons, having a value of $1,940,920. There are blast furnaces also in other parts of that section which were not in operation last year, and still others situated in the lower peninsula, at Elk Rapids, Leland, Frankfort, Gilmore, Bangor, Caseville, Detroit and Wyandotte.

THE IRON AND STEEL INDUSTRIES OF THE STATE.

In what are called the iron and steel industries—including in these terms furnaces, rolling mills, steel-works, forges and bloomaries, and excluding mines—Michigan ranked as the eighth State in 1880 according to the figures collected for the United States census of that year. It was surpassed by Pennsylvania, Ohio, New York, Illinois, New Jersey, Wisconsin and West Virginia. Its increase in this production from 1870 to 1880 was 65 per cent, and the totals of the returns for 1880 were as follows:

Number of establishments	22
Amount of capital invested	$4,175,386
Number of employés	3,089
Total of wages paid to employés in 1880	$922,597
Value of materials used in 1880	$3,279,420
Value of the total product of 1880	$4,591,613
Weight of the product of 1880 (in net tons)	142,716
" " " " 1879 " "	86,679

OTHER MINERAL RESOURCES.

PLASTER.

Deposits of a superior quality of gypsum, practically inexhaustible in extent and so exposed in the formation as to be easily accessible, have been found at two points in Michigan, viz.; In the bluffs on the shore of Lake Huron, near Alabaster, in Iosco county, and at the outskirts of the city of Grand Rapids where there is a vast bed of this limestone spreading at a depth of from 40 to 70 feet below the surface over an area of ten or twelve square miles. This rock is easily quarried or mined (two or three of the Grand Rapids companies have subterranean openings, taking the mineral from cavern-like excavations), and is either ground for use as a fertilizer or ground and calcined into plaster-of-paris. Some of the finer grained masses are occasionally carved and polished into ornaments. The business is already a prosperous one, and can be developed in the future to meet any probable demand. Its statistics have never been systematically compiled and cannot be accurately given. In 1878 the Commissioner of Mineral Statistics estimated the total product of the State up to that time at 500,000 tons of land plaster and 700,000 barrels of calcined plaster. His report showed that at that date there were seven companies engaged in this business, and that the total product of the two preceding years was 95,000 tons of land plaster and 100,000 barrels of calcined plaster.

Ground plaster for use as a fertilizer sells in the State generally, near railroad points, at about $4 per ton.

COAL.

It is estimated by the geologists that one-fifth of the lower peninsula of Michigan is underlaid by coal-bearing deposits, These "coal measures," as they are termed, are supposed to cover an area of 8,000 square miles, and their limits, as far as ascertained, would be roughly defined by a line drawn from Sebewaing, on Saginaw bay, successively through Holly, Jackson, Albion, Hastings and Big Rapids, and thence through Osceola, Clare and Gladwin counties to the mouth of the Rifle river in Bay county. The coal is bituminous and easily broken, possesses excellent heat-producing qualities, and burns with a bright flame, leaving but a small residuum of ashes. It has not been found, as yet, in large quantities at any one point, and is not sufficiently exposed in the formation to make exploring easy or cheap, while it is, in its natural

state, too highly bituminous or not pure enough to make its use possible for smelting, blacksmithing or the manufacture of gas. The result is that it has been mined, thus far, to a limited extent only. Still profitably workable beds of coal have been opened at Jackson and Corunna, and their yield has proved equal to any imported coal for the purposes of steam production. The amount taken from these mines in 1880 was estimated at 85,000 tons, and their aggregate yield up to that date at over 600,000 tons. It is claimed by experts who have investigated the subject that the Michigan coal can be cheaply manufactured into a pure coke. If, after thorough experimenting this should prove to be the fact, a new era in the manufacture of iron in this State will be at hand. Furnaces will then spring up which will smelt the Lake Superior ores with the lower peninsula coal, and Michigan will rival Ohio and Pennsylvania in this great industry. As yet the stock of coal in this State is practically untouched, and only awaits the discovery of some method of making it more useful to become an important source of wealth.

STONE, SLATE, AND EARTHS.

Michigan is rich in sandstones and limestones of commercial importance. Building stones of excellent quality have been found at many points in the State, and quarries have been opened in the counties of Calhoun, Eaton, Ingham, Ionia, Jackson, Marquette and Monroe. The Marquette brown stone is of particularly fine texture and capable of receiving a high finish; it does not suffer by comparison with any of the free stones known to American builders. Its supply is practically inexhaustible, and its quarrying is an infant industry which must inevitably develop into great importance. The grindstones of the Huron county quarries have no superior in the northwest, and gritstones of good quality are found elsewhere in the State. The slates of the Huron Bay district, in Baraga county in the upper peninsula, are of excellent quality and cannot be surpassed in the American market in durability and color; these quarries can be developed to a practically unlimited extent and must certainly become the centre of a large and thriving industry. The iron district produces a quartz rock which is supplanting the foreign quartz long imported for the lining of Bessemer steel converters and similar purposes. Clays and sands of commercial value are found everywhere in abundance. Brick and tile yards are numerous and successful potteries are in operation at different points. At Raisinville, Monroe county, is found a superior quality of glass sand, suitable for use in the manufacture of the finer grades of cylinder and plate glass. This has been shipped in large quantities to Pittsburg and Ontario, and is also used in the manufactory of window glass located at Delray, below the city of Detroit. This establishment is, as yet, the only one of its kind in Michigan; in 1880 it employed 54 workmen, paying them $30,000 in wages, and its product amounted to 30,000 boxes of glass of the value of $90,000.* Lime kilns are common throughout the State. Valuable marbles are among its rocks, and vast quantities of peat exist and must ultimately become valuable for fuel.

SILVER.

Native silver has been found in small quantities in the upper peninsula. It was taken from time to time from the openings of the Minesota and the Cliff, and in the stamp mills of some of the mines upon the Pewabic lode the washed mineral is looked over for this metal. Seams of rock carrying granular silver have also been found in the Iron river district of Ontonagon county and occasioned some excitement at the time of their original discovery. The systematic mining of this metal has never been attempted in this State with profitable results.

* This establishment was destroyed by fire in September, 1881, but is being rebuilt with enlarged facilities.

FISHERIES.

That Michigan has the most productive fresh-water fisheries in the United States is easily explained by its geographical position. All the important towns on the shores of the great lakes and their connecting straits are the centers of a fishing interest which employs annually several thousand men, uses many steam and sail vessels of small tonnage, and has a large amount of capital invested in nets, shanties, ice-houses, boats and their outfit. The catch is principally confined to whitefish, lake trout, sturgeon, bass, pickerel and herring, and is marketed fresh, salted or frozen. Oil is also obtained in considerable quantities from the offal and unmarketable fish.

GAME AND FOOD FISH OF THE INLAND LAKES.

The inland lakes, of which more than 5,000 are found in the State, and the numerous streams also abound in the smaller varieties. Brook trout and grayling are plenty in some of the small rivers of the northern counties, and black bass are caught in many of the lakes. Sportsmen in great numbers flock annually into the thinly settled regions towards the Straits of Mackinac in quest of game fish. Perch, eels, pike and other common varieties contribute to the food supply of the State.

ARTIFICIAL PROPAGATION.

The State has shown its appreciation of this interest by the passage of general laws for the protection and preservation of the best varieties of food fishes, and by the creation and maintenance of a Fish Commission. This board is charged with the artificial propagation of fish, which are planted in what are believed to be suitable waters for their natural development. It has hatcheries at Detroit, Pokagon in Cass county, and Boyne Falls in Charlevoix county, and up to the close of 1880 had planted in lakes and rivers (principally in Lakes Huron and Michigan) 80,000,000 young whitefish, 1,000,000 silver eels, 1,000,000 lake trout, over 2,000,000 of the various varieties of salmon, 500,000 brook trout, and smaller numbers of shad, grayling, bass and pike. Excellent results have thus far followed this work in the cases of whitefish, land-locked salmon and eels.

FISHING AS AN INDUSTRY—MICHIGAN EMPLOYS ONE-THIRD OF THE AMERICAN LAKE FISHERMEN.

At the federal census of 1880 a large amount of information was obtained concerning the fisheries of the great lakes, which has been compiled and tabulated, and given to the public in Census Bulletin 261, under date of September 1, 1881. This information covers the statistics of the fishing industry, as connected with the great lakes, of eight States, viz.: Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania and New York, and the general summary of the number of men and vessels engaged and the amount of capital employed is given in the table which follows:

Number of Men and Vessels engaged in Lake Fishing and Capital employed in 1880.

STATES.	FISHERMEN.	APPARATUS AND ACCESSORIES.	STEAM TUGS.		VESSELS AND BOATS.		TOTAL VESSELS, BOATS AND STEAM TUGS.		FISH POUNDS.	
	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.
Total	5,050	$1,345,975	49	$124,800	1,607	$141,800	1,656	$266,600	1,500	$497,400
Minnesota	35	$10,160	1	$5,000	10	$900	11	$5,900	2	$700
Wisconsin	800	222,840	12	26,900	318	24,775	330	51,675	290	89,675
Michigan	1,781	442,665	24	45,400	466	63,445	490	108,845	375	134,775
Illinois	300	83,400	1	3,000	103	7,500	104	10,500	14	9,800
Indiana	52	29,360	1	2,500	15	1,650	16	4,150	27	14,850
Ohio	1,046	473,800	9	38,400	487	29,830	496	68,230	758	233,600
Pennsylvania	114	24,700	------	------	37	3,700	37	3,700	------	------
New York	922	59,050	1	3,500	171	10,000	172	13,600	34	14,000

It will be seen by this statement that the number of fishermen employed in the Michigan fisheries is more than 70 per cent greater than that of any other lake State. If the number incidentally connected with the trade should be added the aggregate would be largely increased. The number of gill-nets used here is stated to be 20,330, with a value of $113,900. Wisconsin, which stands second in this item, has 10,959 gill-nets, valued at $49,920.

FISHING FOR FOOD AND COMMERCE—NEARLY ONE-HALF THE PRODUCT OF AMERICAN LAKE FISHING IN 1879 TAKEN IN THIS STATE.

Another table compiled by the same authority gives the

Quantities and Values of Fish taken in the Great Lakes in 1879.

STATES.	TOTAL.		WHITEFISH.		TROUT.		HERRING.		STURGEON.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total....	68,742,000	$1,652,900	21,463,900	$778,100	6,804,600	$221,700	15,356,300	$117,100	7,012,100	$116,300
Minnesota.	176,000	$5,200	150,000	$4,500	.....	.....	.....	.....	.....	.....
Wisconsin.	10,194,600	276,605	4,265,850	145,400	2,053,200	$60,550	2,426,900	$33,100	598,100	$16,600
Michigan...	24,013,100	711,695	12,902,250	461,800	4,148,000	137,300	1,505,000	20,100	1,949,000	29,575
Illinois	2,937,500	53,000	500,000	17,500	.....	.....	50,000	750	2,275,000	32,500
Indiana....	1,173,500	33,820	396,000	17,770	7,500	250	.....	.....	600,000	9,000
Ohio.....	24,924,300	355,000	1,100,800	39,500	26,200	800	11,374,400	63,150	1,590,000	28,625
Pennsylvania	1,253,000	42,480	975,000	34,130	.....	.....	.....	.....	.....	.....
New York..	4,070,000	175,100	1,174,000	57,500	569,700	22,800	.....	.....	.....	.....

Notes attached to this table state that the values are estimated on the basis of the prices of fresh fish, and that of the sturgeon credited to Illinois probably 750,000 pounds came from Wisconsin and a similar amount from Michigan and Indiana, reducing by those figures the general total of Illinois. It will not escape notice that the value of the fish taken by the fishermen of this State in 1879 was more than double that of any other State on the lakes. The reason for this difference, in face of the fact that the total weight caught by Ohio fishermen exceeds that taken here, will be readily comprehended by those who know the difference between whitefish and herring. Of the former variety there were caught in Michigan nearly 13,000,000 pounds, and in Ohio a little over 1,000,000. Of herring Michigan took about 1,500,000 pounds, and Ohio more than 11,000,000.

Other figures given in the census tables are valuable and instructive in their relation to the food supplies of the State, as well as for their commercial character. It appears that of the twenty-four millions of pounds and upwards which formed the total catch of 1879 in this State, nearly sixteen millions of pounds, having a value of more than $466,000, were sold while fresh, most of it, presumably, for home consumption, and nearly one-half of this large supply was composed of whitefish, the finest lake fish known to epicures or in commerce. The salted fish of that year put up in Michigan amounted to 5,349,400 pounds, and were valued at $173,725. Something more than a million and a quarter of pounds of fish were frozen for preservation and sought a market in that condition, its value being $69,360.

THE FISHING SEASON, PRICES, ETC.

The fishing season on the lakes covers the season of navigation. Whitefish are most abundant in the spring and fall months, but are taken in the upper lakes, where the water is always cool, whenever the ice is out. They are never caught with a hook, but in gill-nets and seines. Large pounds are kept for their security, and a considerable trade is maintained through the winter by taking them from holes made in the ice for

that purpose. Improved processes of freezing are growing in use, and fish are regularly supplied to eastern markets which have been preserved in this manner with their best qualities unimpaired.

The ordinary retail price of fresh fish sold near the fishing stations during the season is about five cents per pound, and this includes whitefish, lake trout, bass and pickerel. Whitefish taken through the ice, out of season, or preserved by freezing, will bring 10 to 12 cents per pound in the Detroit market, and 15 to 16 cents in New York. The quotations of salted fish per 100 lbs. at Detroit early in October, 1881, were for whitefish $5.50, trout $4.50 to $4.75, and herring $3.00.

THE VESSEL INTEREST.

According to the tonnage statistics of the United States for the date of June 30, 1880, (as given in the American Almanac for 1881) not one of the States located away from the ocean coast equals Michigan in the number of vessels owned by its citizens or in their aggregate tonnage; the exact figures are given in this table:

STATE.	No. of Vessels.	Total Tonnage.
Michigan	979	162,196
Illinois	450	86,634
Wisconsin	388	74,083
Ohio	485	139,509
Missouri	319	141,975

[The figures of other inland States are small.]

Michigan also surpasses, in this respect, the seaboard States of Connecticut, New Hampshire, Rhode Island and Oregon, and all the cotton and Gulf States, while it far outstrips in tonnage both Virginia and Maryland, although surpassed by them in the number of vessels. It exceeds California in the number of its vessels but not in the tonnage total. The coast line of Michigan is only surpassed by that of Florida, and it has ports upon four of the great lakes. Its coasting trade is exceedingly valuable, and its vessel interest represents much capital and enterprise and deserves an important place in a catalogue of its sources of employment for labor. In this connection the fact should be mentioned that ship-yards are located at Detroit, Wyandotte, Port Huron, Bay City, Marine City, St. Clair, Grand Haven and other shore towns and ports.

GENERAL MANUFACTURING.

The miscellaneous manufacturing interests of the State are numerous, extensive and in thriving condition, but until the figures gathered at the census of 1880 shall be made public, it is not possible to give their statistics. The great industrial development of Michigan since 1874 would make any present use of conclusions drawn from the State census of that year utterly misleading, and all that can be done now is to deal with the subject generally and not in details. Treating it in that way it can be said that the State especially excels in her manufactures of railroad cars of all

grades; of agricultural implements, from the cheapest hoe to the most costly threshing machine; of furniture, both in soft and hard woods; of stoves, wooden-ware, paper and paper pulp, wagons and carriages, matches and cut tobacco. The annual product of its flouring-mills, planing-mills, sash and door factories, foundries, machine-shops, cigar factories, tanneries, breweries, bakeries, boot and shoe factories and clothing establishments, must in each case be estimated by millions. Other important items in its list of manufactures are confectionery, saddlery and harness, safes, woolen goods, dried fruits, cider and vinegar, butter and cheese, chemicals, picture frames and essential oils. The leading towns of Michigan are, with few exceptions, important manufacturing centers. This is especially true of Detroit, Grand Rapids, Jackson, Bay City and West Bay City, East Saginaw and Saginaw, Battle Creek, Niles, Flint, Kalamazoo, Adrian, Allegan, Big Rapids, Buchanan, Holland, Jonesville, Lansing, Manistee, Muskegon, Grand Haven, Monroe, Owosso, Three Rivers, Lapeer, Ludington, Charlotte, Alpena, Cadillac, Cheboygan, Greenville, Hastings, Ionia, Marquette, Ishpeming, Negaunee, Hancock, Houghton and Wyandotte.

The growth of the manufacturing interest in Michigan has been healthy and rapid. The State is rich in natural resources, and by reason of its situation commands, through the impulse of active competition, the advantages of cheap transportation. Its industries are unusually diversified in their character, and skilled labor will never be at a loss, under the ordinary conditions of business, to find ready employment and good wages. It adds to the openings of a steadily advancing material civilization the attractions of a settled society and the security of wholesome laws. Its active and governing citizens are working men; its climate is favorable to labor; and that thrift will follow well-directed industry is proved by the experience of its people.

MICHIGAN AS A FARMING STATE.

Notwithstanding the enormous wealth of Michigan in other resources, it is in agriculture, in which at least half of its active population are employed, that it develops its greatest eminence. This eminence, of which ample proof will be given, has for its foundations natural advantages of which the State cannot be divested, and which ensure to its prosperity a permanent and enduring character.

I. The fertility and diversity of the soil. A separate chapter on this subject, prepared by an authority which is recognized in this State and elsewhere as entitled to the highest consideration, both for scientific and practical knowledge, is printed on subsequent pages.

II. The geographical position of Michigan, altogether unique in its character, affecting both its climate and its markets. Lake Superior, more than 400 miles long and the largest fresh water sea in the world, washes its northern shores; Lake Michigan, 345 miles in length, second in size, and the largest lying wholly within the United States, forms the greater portion of its western boundary; and Lakes Huron, St. Clair and Erie, with their connecting rivers, mark its limits on the east. Excepting about 170 miles of its southern extremity the entire lower peninsula is surrounded by water; and excepting a similar distance on its southern and southwestern boundary the same is true of its upper peninsula. With this enormous expanse, varying in depth from a hundred to a thousand feet, and defining a coast line of more than 1,600 miles—half the breadth of the Atlantic—eternally operating upon the soil and atmosphere of a territory, every farm on which lies less than a hundred miles from its touch, and affording during a large part of every year the cheapest transportation known to commerce, the simplest imagination must realize the existence of peculiar geographical conditions unknown elsewhere in the agricultural States. The effect of these conditions on the climate of the State will be treated more at large in future pages.

III. The accessibility and nearness to the great markets of the world, taken in connection with the comparatively small capital needed to work upon, constitute another and very important reason for the profitableness of farming in Michigan. Every hundred miles saved in transportation to the seaboard adds to the value of the staple agricultural productions. No State or territory in the union has so many cheap and fertile lands within so easy reach of the leading markets.

IV. The wonderful diversity of natural resources in Michigan, and the manufacturing interests to which they contribute, create a constant and increasing home market for the products of the soil. Vast quantities of the yield of the farm and garden go to the mills, lumber camps, furnaces and mines, and find ready and profitable sale. There are few neighborhoods where some of these markets are not found, and the wagons of the farmers of the vicinity bringing hay, oats, potatoes, butter, cheese, eggs, poultry, fresh meat and fruit are always welcomed and rewarded with good prices.

COMPILATION OF AGRICULTURAL STATISTICS.

The United States Department of Agriculture has organized a system of information which is of great value both to the people of this country and to those who may contemplate settling here. It is based upon the reports of special correspondents, consisting, as the Department explains, of four in each settled county, and numbering

several thousand in the aggregate, who are selected for their familiarity with the local agricultural interests of their respective counties. These men become trained observers of the sections they are appointed to inspect, and make periodical reports which are compiled at Washington, the results, arranged and classified, being then made public. The comparative statistics thus collected and handled are not exposed to the suspicion of prejudice or partiality, and conclusions drawn from them must command respect.

COMPARATIVE RESULTS IN TWELVE FARMING STATES FOR FIVE YEARS.

The reports of the Department of Agriculture for the years 1875, 1876, 1877, 1878 and 1879 present a series of figures which when placed in juxtaposition form the following table. It shows the average cash value *per acre* of eight leading productions of the farm, taken together, in twelve of the chief farming States of the Union, during a term of five years. These crops are wheat, corn, rye, oats, barley, buckwheat, potatoes and hay. The States are arranged in the order of precedence.

Average Cash Value per Acre of Eight Principal Crops of Twelve Farming States During Five Years.

STATE.	1875.	1876.	1877.	1878.	1879.	Total for Five Years.
Michigan	$17 53	$14 46	$15 63	$13 88	$18 96	$80 46
Pennsylvania	18 58	15 65	14 30	13 91	17 68	80 12
New York	16 73	15 33	14 79	12 72	14 15	73 72
Ohio	13 55	12 96	13 34	12 08	15 58	67 51
Wisconsin	13 08	10 93	11 10	9 77	13 80	58 68
Indiana	12 00	10 63	11 42	9 85	14 66	58 56
Minnesota	12 70	8 30	12 79	7 76	10 29	51 84
Illinois	11 46	8 10	10 04	7 68	12 47	49 75
Missouri	10 59	9 18	9 68	7 69	10 78	47 92
Kansas	9 51	10 37	8 39	7 58	9 11	44 96
Iowa	8 60	7 30	9 09	5 80	8 88	39 67
Nebraska	7 28	6 40	7 89	6 55	8 60	36 72
Average of 11 States excluding Michigan	$12 19	$10 47	$11 17	$9 22	$12 36	$55 41

Without the combination of a fertile soil and convenient markets the precedence which the foregoing table awards to Michigan could not have been obtained. That general farming was more profitable here than in the other great States included in the comparison during the five years covered by it was due to nature and not to art.

PROFITS OF GRAIN GROWING IN THE WEST AND NORTHWEST IN 1879.

The principal cereals which seek markets out of the State are wheat, corn, oats and barley. The same articles are grown also in the other western and northwestern States and territories in which cheap farming lands are to be had, and those who carefully examine the comparative yield per acre and value per bushel of these products in the States and territory named, for the last agricultural year having full recorded statistics, will the more readily comprehend the results exhibited above, and cannot fail to be impressed, not only with the bounty of its soil, but with the advantages which nearness to the great markets of the continent afford to the farmers of Michigan:

*Average Yield per Acre, Price per Bushel, and Value per Acre, of the four Principal Cereals of the Western and Northwestern States holding Cheap Lands, and of Dakota Territory, for the Year 1879.**

STATE, ETC.	WHEAT.			CORN.			OATS.			BARLEY.		
	Bushels per acre.	Price per bushel.	Value of crop per acre.	Bushels per acre.	Price per bushel.	Value of crop per acre.	Bushels per acre.	Price per bushel.	Value of crop per acre.	Bushels per acre.	Price per bushel.	Value of crop per acre.
Michigan....	19.5	$1 17	$22 81	40	$0 45	$18 00	34	$0 35	$11 90	22	$071	$15 62
Indiana.....	18.1	1 17	21 18	32	34	10 88	25	28	7 00	23	78	17 94
Illinois.....	15.9	1 07	17 01	36	31	11 16	32	27	8 64	22	59	12 98
Wisconsin..	12.8	1 04	13 31	35	39	13 65	34	30	10 20	24	61	14 64
Minnesota..	11.4	94	10 72	34	27	9 18	38	23	8 74	26	43	11 18
Iowa.....	10.2	92	9 38	42	24	10 08	34	23	7 82	20	45	9 00
Missouri....	12.	1 01	12 12	36	25	9 00	21	26	5 46	19	....	.....
Kansas.....	9.3	89	8 27	31	27	11 37	19	26	4 94	13	43	4 59
Nebraska...	9.5	84	7 98	40	21	8 40	26	23	5 98	15	37	5 55
Dakota Ter.	9.4	94	8 84	22	35	7 70	26	28	7 28	14	....	.....

* The yield of bushels per acre as given in this table is taken from U. S. Census Bulletin 175, of May 30, 1881. The average prices per bushel are taken from the Report of the Agricultural Department for 1879, except those for the Territory of Dakota, which were furnished by the Statistician of that Department, at the request of the compiler of this pamphlet, in a letter dated August 8, 1881. The third column under each head, giving the value of each crop per acre, is the product of the other two.

It is not necessary to speculate upon the conclusions to be drawn from these figures. They speak for themselves. In the average productiveness of its soil, the average cash values of its crops, and the extent and cheapness of the new farming lands it offers for agricultural purposes,—taking all these considerations together—Michigan is unequaled among either the States or the territories in the advantages it offers to farmers of small means.

MICHIGAN WHEAT.

The great crop of Michigan is wheat. Its exports bring more money into the State than all its other surplus crops. The census figures show that its aggregate production has about doubled in every ten years since 1840, and that the average yield per acre has increased from 10 bushels in 1849 to 19.49 bushels in 1879, and, according to the "Farm Statistics," compiled at Lansing, to 17.29 bushels in 1880.

FOURTH IN RANK IN THE VOLUME OF PRODUCTION.

Bulletin 175, issued by the Census Bureau at Washington, May 30, 1881, shows that Illinois, with a yield of Fifty-one millions, Indiana, with a yield of Forty-seven millions, and Ohio, with a yield of Forty-six millions of bushels, were the only States that produced as much wheat in 1879 as Michigan, which had a crop of Thirty-five and a half millions of bushels. In proportion to the number of acres sown, according to the same authority, the crop in this State was the largest. The product of that year was nearly four and a half millions of bushels greater than that of New York and Pennsylvania combined.

WHITE WINTER THE PRINCIPAL MICHIGAN CROP.

The wheat raised in this State is almost exclusively that which is known as white winter. There is some spring wheat sown, producing excellent crops, but the practice is not common, and virtually Michigan spring wheat is almost unknown in the market. It is the influence of the surrounding water upon the climate that makes this general culture possible. The growth of winter wheat in the other northwestern States and in the territories lying east of the Rocky Mountains is almost as rare as that of spring wheat in Michigan. Nearly all that reaches the market from those sections is of spring sowing. The wheat of this State holds a very high rank in the market, and has a standard of its own. Michigan white winter flour is known in nearly every European grain exchange.

SEED TIME AND HARVEST.

Wheat in Michigan is put into the ground between the 10th of September and the 5th of October, according to the forwardness of the season and the condition of the weather. Ordinarily the 10th to the 20th of September is the seeding time. The wheat usually gets a growth of three to four inches before the snows of winter come upon it. In the average Michigan winter the wheat is protected throughout by the snow, and comes out in the spring looking fresh and green. Especially is this the case in the northern portion of the State. There is very little heaving of the soil by frost in winter, even where it is unprotected by snow, so that open winters are usually not injurious to the crop if the spring weather be favorable.

The harvest generally begins in the southern portion of the State in the first week of July, and that month sees the crop garnered throughout most of the State. Labor-saving machinery is so generally in use that harvesting is quickly and easily managed. On the whole, taking one year with another, there is no crop in Michigan more sure and reliable than the wheat crop, and the past experience of the farmers of the State has been that there is none more profitable.

PROCESS OF CULTIVATION.

Wheat does not rapidly exhaust the soil. Upon the newest lands a crop may be raised every year. There are localities in which the soil is too strong for profitably raising wheat until it is reduced by constant cropping. The ordinary practice in the newer portions of the State, however, is to alternate wheat with corn, oats and other spring crops, taking a crop of wheat every second year. In those parts of the State longest under cultivation the practice known as "seeding down" is followed. Clover is sown broadcast upon the field in March or April before the wheat is harvested. This takes root and yields pasturage the same autumn. The next season the farmer takes from the field a crop of hay. The second season he may plow his clover sod under and plant corn, putting in wheat the following September, after the corn has ripened; or, what is the better practice with careful farmers, he may turn under his heavy growth of clover in June and let the field lie fallow until the time for sowing wheat. The clover thus turned under, supplemented sometimes by rotted wheat-straw and barn-yard manure, proves a rich fertilizer. By this latter treatment a crop of wheat is produced each third year, and the yield per acre of the fields under cultivation for fifty years is kept very nearly up to those but freshly reclaimed from nature.

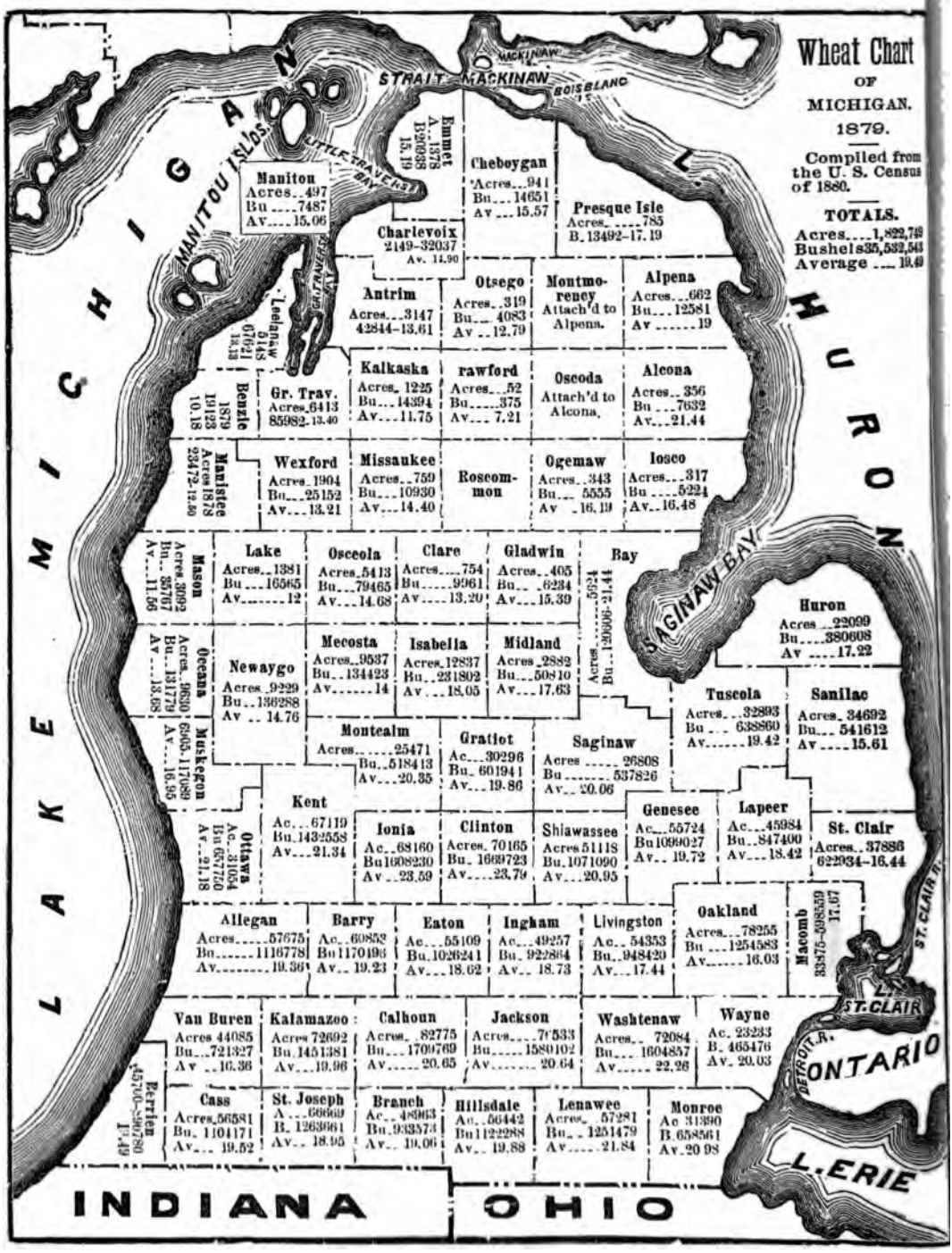
OTHER CHEAP FERTILIZERS.

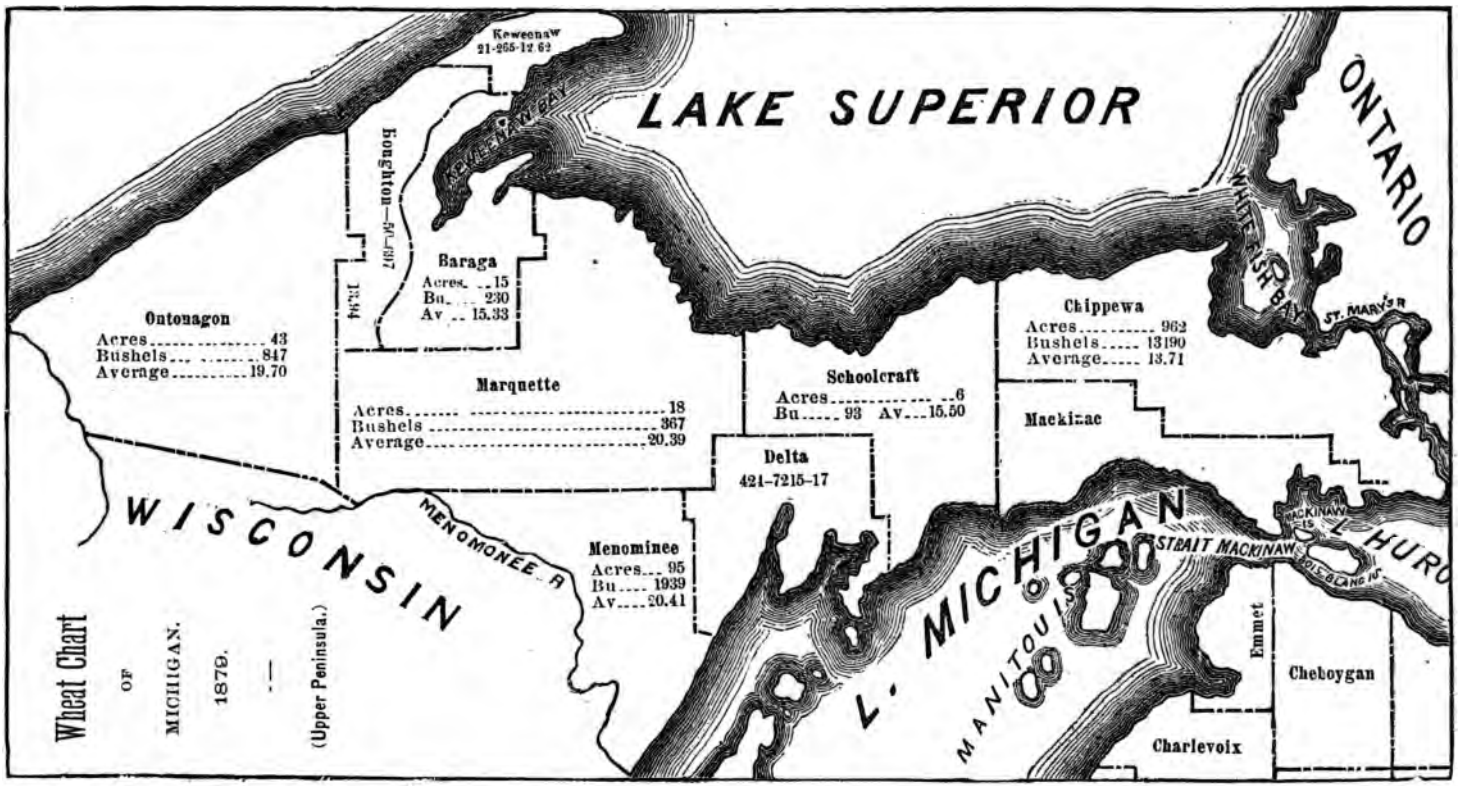
Gypsum has long been extensively used in the State. It abounds in the vicinity of Grand Rapids and in Iosco county. It is easily mined and is furnished to the

farmers at very low prices. The refuse of the salt manufactories, which are numerous in Michigan, has been proven to be a very valuable fertilizer. It is delivered to the farmer at almost any railroad station in the State at $4 per ton. A ton is sufficient for ten acres and the effect of one application is felt through two or three seasons. The cost of gypsum is about the same, but of this latter a fresh application is required every year. In some localities muck is used in making a compost with barn-yard manure. The only cost is for handling. Within the last few years farmers have been experimenting with super-phosphate, an article made by treating bone dust with sulphuric acid. The experiments are reported to have been successful, and the sales of the article are extending and its manufacture becoming an important industry. There are numerous beds of marl scattered about the State, and this material is easily converted into quick lime, which is used to some extent as a fertilizer and is found to be very valuable upon some soils.

A WHEAT CHART OF THE STATE.

The diagrams which are used in connection with the publication of wheat statistics by the State Department illustrate with great clearness the general productive capacity of Michigan in this important cereal. They are given here for the sake of convenience, and show the acreage, crop and average yield per acre of each county, in the year 1879, as returned at the United States Census of 1880. Persons not familiar with the State should be advised that the southern counties, where the heaviest proportion of the crop is produced, are composed of the old settlements. The more northern sections, where the population is yet comparatively sparse, exhibit a relatively small acreage. Their average yield, however, is a good one, even with a less careful cultivation than prevails in the older counties, and shows conclusively the general adaptation of the State to the production of wheat. It is a higher average than that of Iowa, Kansas, Nebraska or Dakota in the bountiful harvest of 1879, as may be seen by comparison with the table heretofore presented in these pages.


Wheat Chart
OF
MICHIGAN.
1879.
Compiled from the U. S. Census of 1880.
TOTALS.
Acres....1,822,749
Bushels35,532,543
Average 19.49
LAKE MICHIGAN
LAKE HURON
STRAIT MACKINAW
MACKINAW
BOIS BLANC I.
MANITOU ISLDS.
LITTLE TRAVERSE BAY
GRAND TRAVERSE BAY
SAGINAW BAY
ST. CLAIR R.
L. ST. CLAIR
DETROIT R.
ONTARIO
L. ERIE
INDIANA
OHIO
Manitou
Acres..497
Bu....7487
Av....15.06
Emmet
A..1378
B36938
15.19
Cheboygan
Acres...941
Bu...14651
Av ...15.57
Presque Isle
Acres.....785
B. 13492-17.19
Charlevoix
2149-32037
Av. 14.90
Antrim
Acres...3147
42844-13.61
Otsego
Acres..319
Bu...4083
Av ..12.79
Montmorency
Attach'd to Alpena.
Alpena
Acres...662
Bu....12581
Av 19
Leelanaw
6148
67621
13.13
Benzie
1879
19123
10.18
Gr. Trav.
Acres.6413
85982-13.40
Kalkaska
Acres..1225
Bu...14394
Av....11.75
rawford
Acres...52
Bu.....375
Av.... 7.21
Oscoda
Attach'd to Alcona.
Alcona
Acres...356
Bu ...7632
Av....21.44
Manistee
Acres 1878
23472-12.50
Wexford
Acres.1904
Bu...25152
Av...13.21
Missaukee
Acres..759
Bu...10930
Av....14.40
Roscommon
Ogemaw
Acres..343
Bu... 5555
Av ..16.19
Iosco
Acres...317
Bu 5224
Av..16.48
Mason
Acres.3092
Bu..35767
Av....11.56
Lake
Acres..1381
Bu...16565
Av.....12
Osceola
Acres.5413
Bu...79465
Av....14.68
Clare
Acres....754
Bu.....9961
Av....13.20
Gladwin
Acres..405
Bu...6234
Av....15.39
Bay
Acres.....5924
Bu..120906-21.44
Huron
Acres ..22099
Bu....380608
Av 17.22
Oceana
Acres..9630
Bu..131779
Av....13.68
Newaygo
Acres.9229
Bu..136288
Av .. 14.76
Mecosta
Acres.9537
Bu..134423
Av.....14
Isabella
Acres.12837
Bu...231802
Av ...18.05
Midland
Acres.2882
Bu...50810
Av...17.63
Tuscola
Acres...32893
Bu ... 638860
Av.....19.42
Sanilac
Acres..34692
Bu... 541612
Av 15.61
Muskegon
6363-117089
Av...16.35
Montcalm
Acres.....25471
Bu..518413
Av....20.35
Gratiot
Ac...30296
Bu..601941
Av...19.86
Saginaw
Acres 26808
Bu 537826
Av...20.06
Ottawa
Ac..31054
Bu 657750
Av..21.18
Kent
Ac...67119
Bu.1432558
Av....21.34
Ionia
Ac..68160
Bu1608230
Av ..23.59
Clinton
Acres.70165
Bu. 1669723
Av....23.79
Shiawassee
Acres 51118
Bu.1071090
Av....20.95
Genesee
Ac...55724
Bu1099027
Av.. 19.72
Lapeer
Ac...45984
Bu..847400
Av....18.42
St. Clair
Acres...37886
622934-16.44
Allegan
Acres.....57675
Bu.....1116778
Av.....19.36
Barry
Ac..60852
Bu1170196
Av.. 19.23
Eaton
Ac...55109
Bu.1026241
Av....18.62
Ingham
Ac...49257
Bu. 922864
Av.. 18.73
Livingston
Ac.. 54353
Bu..948420
Av...17.44
Oakland
Acres...78255
Bu ...1254583
Av.....16.03
Macomb
33875-598559
17.67
Van Buren
Acres 44085
Bu...721327
Av ..16.36
Kalamazoo
Acres 72692
Bu.1451381
Av...19.96
Calhoun
Acres..82775
Bu....1709769
Av.....20.65
Jackson
Acres....76533
Bu.....1580102
Av.....20.64
Washtenaw
Acres.. 72084
Bu....1604857
Av..... 22.26
Wayne
Ac. 23233
B. 465476
Av. 20.03
Berrien
45700-890780
19.49
Cass
Acres.56581
Bu. 1104171
Av... 19.52
St. Joseph
A...66669
B. 1263661
Av.. 18.95
Branch
Ac..48963
Bu.933574
Av.. 19.06
Hillsdale
Ac..56442
Bu1122288
Av.. 19.88
Lenawee
Acres..57281
Bu...1251479
Av.....21.84
Monroe
Ac 31390
B.658561
Av.20 98


Wheat Chart
OF
MICHIGAN.
1878.
(Upper Peninsula.)
LAKE SUPERIOR
ONTARIO
L. MICHIGAN
L. HURON
WISCONSIN
Keweenaw
21-265-12 63
Houghton—26-287
12.44
Baraga
Acres..15
Bu..230
Av..15.33
Ontonagon
Acres.....43
Bushels.....847
Average.....19.70
Marquette
Acres.....18
Bushels.....367
Average.....20.39
Menominee
Acres...95
Bu....1939
Av....20.41
MENOMONEE R.
Delta
421-7215-17
Schoolcraft
Acres.....6
Bu.....93 Av...15.50
Chippewa
Acres.....962
Bushels.....13190
Average.....13.71
ST. MARY'S R.
Mackinac
MACKINAW IS.
STRAIT MACKINAW
ILS. AUX BLANC IS.
MANITOU IS.
Emmet
Cheboygan
Charlevoix

CEREALS AND OTHER PRODUCTS.

Table showing the Products of each County in the State for the Year 1879, in Six of the Principal Farming Crops, the Cereals being reported by the U. S. Census Bureau, and other products in Returns to the Secretary of State, together with the Number of Acres devoted to each Crop.

COUNTIES.*	CORN.		OATS.		BARLEY.		PEAS.		POTATOES.		HAY.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Tons.
Alcona	29	877	378	11,115	25	581	137	3,019	163	19,086	906	1,500
Allegan	35,410	1,368,851	11,511	360,334	1,310	28,323	40	902	2,549	251,864	28,618	30,777
Alpena	59	1,901	741	23,218	50	989	202	4,635	207	26,763	1,775	1,993
Antrim	1,316	48,382	749	21,616	147	2,437	128	2,207	531	63,435	2,107	1,980
Baraga	.....	.....	44	850	7	190	5	90	135	6,108	277	397
Barry	27,838	987,897	10,221	331,636	278	6,348	19	289	1,725	170,351	20,168	23,292
Bay	2,648	94,755	3,065	96,815	99	2,484	185	3,748	1,292	109,022	6,061	7,483
Benzie	1,436	29,315	479	11,367	32	598	68	1,029	420	30,859	1,560	1,300
Berrien	35,557	1,077,146	13,276	410,754	133	3,216	26	851	2,080	155,637	20,037	24,923
Branch	35,146	1,475,626	13,316	475,288	62	1,604	97	2,109	1,895	194,529	24,929	27,687
Calhoun	34,818	1,402,013	15,877	579,852	941	23,103	5	85	1,672	166,869	25,867	26,923
Cass	39,360	1,393,481	12,459	369,914	26	532	34	812	1,761	144,364	18,710	23,422
Charlevoix	879	23,144	983	25,477	40	952	203	3,917	383	43,126	1,433	1,459
Cheboygan	83	3,079	859	21,545	19	337	204	4,394	268	35,897	1,332	1,766
Chippewa	15	380	692	16,295	24	558	239	4,632	83	9,889	329	489
Clare	324	7,123	274	5,707	.....	.....	14	269	208	13,660	703	689
Clinton	20,420	693,972	14,587	529,549	944	20,370	147	2,252	1,780	149,762	23,743	27,579
Crawford	280	2,160	105	1,555	.....	.....	2	39	156	12,968	142	156
Delta	48	1,146	839	25,143	28	557	87	1,421	245	26,267	1,369	1,420
Eaton	26,628	1,009,121	13,414	493,523	417	9,754	209	3,534	2,003	215,765	23,796	28,165
Emmet	948	27,515	478	14,746	60	1,342	51	455	303	40,847	284	406
Genesee	22,088	721,101	21,101	768,563	1,470	30,859	364	5,196	2,146	180,231	33,127	32,763
Gladwin	120	3,553	209	5,677	.....	.....	35	655	93	6,283	709	671
Grand Traverse	3,302	95,983	2,087	54,751	131	2,421	351	4,845	1,015	109,955	4,958	4,527
Gratiot	12,853	390,899	8,099	256,535	346	6,813	141	2,153	1,128	93,813	10,884	12,876
Hillsdale	37,171	1,390,481	17,286	647,248	448	9,364	2,160	40,089	1,390	147,456	29,078	35,836
Houghton	.....	.....	280	5,407	116	1,197	2	50	703	11,170	1,795	2,277
Huron	1,580	53,314	5,715	156,803	410	7,901	4,998	95,231	1,178	118,691	12,220	15,646
Ingham	22,969	776,777	11,245	416,011	748	17,917	248	5,136	1,684	163,933	24,044	26,511
Ionia	22,356	744,577	12,513	399,099	2,107	44,255	73	1,065	2,227	186,741	25,331	29,705
Iosco	111	3,702	294	9,264	10	136	136	2,913	231	20,088	1,594	2,199
Isabella	4,539	138,391	3,805	91,495	145	2,395	246	3,076	864	64,589	5,705	5,563

Jackson	33,093	1,237,914	13,002	469,033	888	22,179	40	944	2,286	219,439	33,745	38,220
Kalamazoo	37,123	1,467,269	10,968	373,629	556	13,542	.....	.....	1,584	159,961	27,811	30,243
Kalkaska	877	27,226	360	9,641	.....	.....	119	2,006	374	47,375	819	693
Kent	30,498	941,916	16,446	447,489	1,377	27,985	54	659	3,568	301,937	34,138	33,510
Keweenaw	.....	.....	17	480	.....	.....	.....	.....	18	3,975	107	376
Lake	636	13,866	382	8,854	59	1,061	123	1,614	317	25,287	1,224	847
Lapeer	14,844	435,759	13,868	460,054	2,406	50,030	2,598	35,695	1,770	135,970	25,092	25,724
Leelanaw	2,250	54,370	1,822	38,673	57	1,045	148	1,877	871	86,654	3,162	2,722
Lenawee	46,646	1,759,467	24,671	952,933	1,360	33,786	863	15,270	1,738	188,358	39,963	51,621
Livingston	22,002	723,927	10,756	393,846	1,862	39,738	12	171	1,666	139,689	31,125	32,769
Mackinac	.....	.....	32	985	.....	.....	14	176	27	2,522	146	84
Macomb	21,284	696,151	24,352	935,474	2,714	60,877	1,215	17,419	2,847	258,678	29,792	32,090
Manistee	1,330	28,346	947	21,509	188	2,902	72	1,126	472	40,410	2,234	2,110
Manitou	81	1,976	220	4,118	20	460	4	90	140	14,625	376	393
Marquette	.....	.....	427	13,604	9	244	37	724	383	39,642	1,948	1,678
Mason	1,603	42,259	936	21,548	244	3,741	170	2,770	861	75,883	1,962	1,440
Mecosta	3,839	84,289	3,201	56,219	274	3,407	286	2,682	1,054	69,046	5,457	4,191
Menominee	82	1,802	364	9,636	27	456	11	269	190	22,970	311	383
Midland	1,564	42,603	1,349	38,101	21	296	196	3,320	435	35,911	3,459	4,514
Missaukee	363	9,075	872	18,668	46	1,083	50	581	156	14,204	1,329	870
Monroe	32,118	1,114,570	19,629	745,143	2,189	54,907	132	2,710	2,360	209,850	24,620	30,334
Montcalm	9,985	278,567	6,171	155,191	513	9,736	133	1,379	1,389	98,663	11,578	13,598
Muskegon	4,082	141,871	2,448	65,026	246	4,780	115	1,551	839	69,384	4,703	4,602
Newaygo	5,934	163,506	2,848	66,776	161	2,527	155	1,907	1,124	92,344	8,325	7,308
Oakland	39,547	1,311,190	26,397	969,048	4,519	104,613	292	5,517	4,723	426,859	46,574	47,531
Oceana	4,682	129,718	1,877	46,346	521	9,329	117	2,172	1,144	109,574	5,509	4,162
Ogemaw	125	4,622	197	6,045	10	163	23	481	132	14,480	404	512
Ontonagon	7	393	461	14,817	33	759	104	2,275	180	19,076	1,200	1,260
Osceola	1,838	62,869	1,811	41,666	124	1,903	288	3,857	931	79,753	4,595	3,805
Otsego	168	6,602	95	24,440	15	261	14	201	207	21,647	249	287
Ottawa	18,830	610,442	10,030	317,935	1,104	25,621	95	1,776	2,130	193,239	14,623	15,613
Presque Isle	272	11,889	1,054	25,424	196	3,323	202	7,592	417	33,660	697	620
Roscommon	9	100	64	1,512	.....	.....	.....	.....	49	4,310	61	84
Saginaw	11,859	376,295	14,246	461,296	905	21,398	472	7,225	2,954	201,676	16,698	21,871
Sanilac	2,650	79,067	12,201	344,121	3,954	82,157	6,749	107,788	1,020	80,284	16,414	17,934
Schoolcraft	6	184	130	4,995	.....	.....	.....	.....	16	5,800	.....	.....
Shiawassee	18,004	602,974	12,852	456,860	1,447	32,132	64	877	1,444	111,877	19,193	20,642
St. Clair	11,168	360,092	27,657	903,611	9,028	192,571	5,317	69,848	2,894	234,228	32,598	34,396
St. Joseph	35,275	1,358,318	9,858	310,042	145	3,159	25	530	2,445	214,163	25,706	30,996
Tuscola	10,759	431,473	9,445	299,411	396	9,598	1,313	21,763	1,738	155,304	15,787	17,890
Van Buren	37,755	1,462,368	10,767	324,319	445	9,288	153	1,771	1,618	159,196	21,830	22,964
Washtenaw	33,220	1,187,756	18,201	754,484	3,814	94,259	157	3,076	1,954	171,518	42,574	51,906
Wayne	32,001	1,198,684	24,659	937,092	1,923	49,083	222	4,420	3,924	409,409	29,218	34,008
Wexford	1,052	33,025	1,116	25,547	137	2,384	78	1,125	536	35,851	2,422	1,767

* Montmorency is included in Alpena county, and Oscoda in Alcona. Isle Royal in Lake Superior, without any agricultural characteristics, is credited with 46 bushels of potatoes.

The United States census of 1880 ascertained the actual yield of the State in the principal cereals for the year 1879 to be as follows:

Wheat, 35,532,543 bushels, Michigan ranking fourth among the States in the amount produced, Illinois, Indiana and Ohio each leading.

Indian Corn, 32,461,452 bushels.

Oats, 18,190,793 bushels.

Barley, 1,204,316 bushels.

Rye, 294,918 bushels.

Buckwheat, 413,062 bushels.

The "Farm Statistics of Michigan, 1879–80," based upon returns from the various counties and compiled in the office of the Secretary of State, show that in the same year of 1879 the State produced of

Clover Seed, 313,063 bushels.

Peas, 538,332 bushels.

Potatoes, 8,025,475 bushels.

Hay, 1,051,115 tons.

Other staples are produced in Michigan of which there are no late returns. The census of 1880, when fully compiled, will supply this deficiency. The preceding census taken by the general government showed an annual product in the State of 828,269 pounds of *Hops*, and 280,325 pounds of *Honey*. The last State census taken showed among the productions of the preceding year 4,101,912 pounds of *Butter*, and 4,319,793 pounds of *Maple Sugar*.

Field Peas produce good crops in nearly all parts of the State, and show remarkable thrift in the northern counties, particularly in the upper peninsula. Many farmers, notably those who come here from Canada, consider them as valuable as corn for feeding stock.

The United States Department of Agriculture, after a critical examination into the feasibility of raising *Beet* root for the manufacture of sugar, reports favorable conditions for its profitable cultivation in most parts of the State. The Legislature, at the session of 1881, passed an act to encourage the culture of sugar cane and the sugar beet, and the manufacture of sugar therefrom, by exempting buildings and machinery employed therein from taxation for five years, and authorizing a bounty on the product.

Tobacco, which figures so largely among the products of many of the States, and contributes so much to the manufacturing statistics of Michigan, must also be included among its agricultural productions. The census of 1880 shows that 173 acres were planted in 1879, and yielded 84,333 pounds. The total yield in 1879 was 5,385 pounds.

The enumeration of the farming products of each county at the federal census of 1880 is only accessible yet as regards the cereals. The Statistics of 1879, collected and compiled at Lansing, furnish information concerning other results of agricultural labor. The table printed on pages 40 and 41, collected from these sources, shows the production of the State for that year, by counties, in the important articles of corn, oats, barley, peas, potatoes and hay, together with the acreage devoted to each crop. The wheat returns are contained in the preceding charts.

The number of acres of "improved land" in each county is shown in the table accompanying the map which prefaces this pamphlet.

CURRENT PRICES IN DETROIT, OCT. 1, 1881.

Flour, white wheat, per bbl., $7.25@7.50; Wheat, No. 1 white, per bushel, $1.43¼@1.43½; Corn, 73½c; Oats, No. 1 mixed, 47c; Barley, per cwt., $2@2.25; Rye, $1.10; Potatoes, 85c@90c; Hay, per ton, $16@18; Peas, per bushel, $1.70@1.75; Beans, $2.50@$3.00; Clover seed, $5.50; Timothy, $2.90@$3.00.

SHEEP AND WOOL.

The census of 1870 showed Michigan to be the fourth State in the Union in the number of sheep and the production of wool—Ohio, California and New York each leading. The product of the State for that year was 8,726,145 pounds. In the value of the fleece per animal it was excelled only by Vermont, New Hampshire and New York.

At the centennial exhibition of 1876, at Philadelphia, an award was made "to the State of Michigan" for its "collective exhibit of samples of wool produced in the State." These samples were contributed by 116 persons in ten counties, and included "461 of Merino and 196 of long combing wools of English blood." The subjoined table, however, with the product of the year 1880 in 1,043 townships, shows that sheep-raising is a common industry all over the State:

Wool Product in 1880.

COUNTIES.	Sheep Sheared.	Pounds of Wool.	Average Clip, lbs.	COUNTIES.	Sheep Sheared.	Pounds of Wool.	Average Clip, lbs.
Alcona	65	433	6.66	Leelanaw	1,401	8,100	5.78
Allegan	38,827	185,822	4.79	Lenawee	105,049	573,528	5.46
Alpena	208	1,092	5.25	Livingston	106,318	631,880	5.94
Antrim	351	2,553	7.27	Mackinac			
Baraga	2	10	5.	Macomb	65,189	358,796	5.50
Barry	50,992	266,572	5.23	Manistee	308	1,724	5.60
Bay	1,111	5,273	4.75	Manitou	595	1,472	2.47
Benzie	117	622	5.32	Marquette	87	410	4.71
Berrien	27,759	134,194	4.83	Mason	174	1,196	6.87
Branch	61,098	306,032	5.01	Mecosta	3,380	18,745	5.55
Calhoun	99,167	530,423	5.35	Menominee			
Cass	36,874	193,938	5.26	Midland	823	4,188	5.09
Charlevoix	260	1,340	5.15	Missaukee	30	155	5.17
Cheboygan	259	1,345	5.19	Monroe	28,217	131,168	4.65
Chippewa	100	414	4.14	Montcalm	14,410	74,963	5.20
Clare	31	140	4.52	Montmorency			
Clinton	61,484	322,899	5.25	Muskegon	1,517	7,502	4.95
Crawford	21	136	6.48	Newaygo	5,090	27,332	5.37
Delta	20	116	5.80	Oakland	128,611	753,656	5.86
Eaton	62,288	321,329	5.16	Oceana	2,071	13,765	6.65
Emmet	33	143	4.33	Ogemaw	20	80	4.
Genesee	76,925	421,190	5.48	Ontonagon	163	655	4.02
Gladwin	26	140	5.38	Osceola	2,025	11,321	5.59
Grand Traverse	2,032	12,702	6.25	Oscoda	2	10	5.
Gratiot	18,212	91,535	5.03	Otsego	6	25	4.17
Hillsdale	87,219	479,227	5.49	Ottawa	13,885	62,080	4.47
Houghton				Presque Isle	90	578	6.42
Huron	7,760	39,719	5.12	Roscommon			
Ingham	61,230	332,057	5.42	Saginaw	12,616	61,804	4.90
Ionia	77,306	400,342	5.18	Sanilac	12,743	67,774	5.32
Iosco	99	432	4.36	Schoolcraft			
Isabella	3,478	17,780	5.11	Shiawassee	59,094	318,810	5.39
Isle Royal				St. Clair	37,513	173,547	4.63
Jackson	104,423	614,503	5.88	St. Joseph	45,601	247,642	5.43
Kalamazoo	70,635	381,027	5.39	Tuscola	19,209	102,136	5.32
Kalkaska	79	523	6.62	Van Buren	41,900	228,101	5.44
Kent	49,428	250,030	5.06	Washtenaw	167,122	1,001,576	5.99
Keweenaw				Wayne	23,752	127,787	5.38
Lake	558	2,766	4.96	Wexford	191	1,058	5.54
Lapeer	54,131	317,048	5.86				
Totals					1,953,810	10,649,411	5.45

The prices paid by dealers for Michigan wool of all grades on the 1st of October, 1881, ranged from 35 to 40 cents per pound.

QUALITY OF THE WOOL.

Experienced dealers state that about three-quarters of the wool produced here rates as fine Spanish, and the remainder is of mixed grades. Sheep-raising is a profitable pursuit in any part of the State. Increased attention is being given to the growth of cross-breeds which may be used both for wool and mutton, and with much success.

THE GREAT FRUIT STATE OF THE NORTHWEST.

[Republished from a paper prepared by Charles W. Garfield, Secretary of the State Horticultural Society.]

When Father Marquette and his Jesuit brothers paddled around our beautiful peninsula over two hundred years ago, dropping here and there a few apple and pear trees along with the "seed of the word," they little dreamed of the great future that was indicated for Michigan in the thrifty growth of seedling fruit trees that were to spring up along their pathway. A few of these old trees, and some that were planted a few years later, are still found in various places on the shores of Erie, Huron and Lake Michigan; they are healthy and strong, bearing regular crops of fruit, monuments of the adaptability of our State to the cultivation of the apple and pear.

It was not until the discovery that peaches could be grown successfully, of the best quality, upon our western Michigan shore, that fruit-growing for market was given an impetus in the State. This was about 1840, and from that date until 1881 the development of fruit culture in our State is without a parallel. Facts have gradually been brought to light in the experience of orchardists that prove Michigan to be peculiarly adapted, on account of her climatic conditions, to a wide range of fruits, from the semi-tropical fig to the iron-clad Siberian crab.

This rapid development has been due to two causes: First, the influence of the great lakes curve the isothermal lines well to the northward, so that a large area is rendered serviceable in the growth of the less hardy fruits; and second, in the rapid development of the Great West to which we are readily accessible, and in which these fruits can not be grown, we have a never failing market for all the surplus.

Lake Michigah is truly a "cherishing mother" to the orchardist. A body of water 345 miles in length and nearly 100 miles in breadth, it would float the three States of New Jersey, Delaware, and Maryland; and it is deep enough almost any where to bury Mount Holyoke beneath its surface. With its 3,400 cubic miles of water in one basin, it maintains a very even temperature throughout the year; and this, with the fact that about sixty-five per cent of our winter winds are westerly, gives the key to our peculiar success in horticulture. We grow peaches successfully along the 45th parallel which bounds Vermont on the north, and raise figs in the open air in latitude 42½°, about on a line with Boston, Massachusetts. It is true that this lake influence is not felt so largely in the interior as along the shore, still, in a large measure, the whole southern peninsula is modified in extremes of weather by this great equalizer. The fact that the western shore from St. Joseph northward to Grand Traverse is especially favored with immunity from frost has given rise to the term

MICHIGAN FRUIT BELT.

This is a strip of territory with a shadowy interior boundary in which peaches are grown with a smaller percentage of failures than elsewhere in the State. Within this belt there is great choice of location for purposes of peach culture; still the purchaser is not compelled to give the same relative importance to altitude that he would farther in the interior.

A very large percentage of the peaches grown in Michigan for shipment abroad, have been, until very recently, raised within the fruit belt; but from the high grounds in Kent, Kalamazoo, Hillsdale, Washtenaw, Lenawee, and other interior counties, large quantities have been shipped in late years.

RAILROADS, WATER LINES, MARKETS.

Michigan is now threaded with lines of railroads; several trunk lines extend across the State from east to west, while others reach into the undeveloped but rapidly growing regions of the north. Thus the fruit-grower who wishes to reach the great markets can readily do so; or if he desires to supply the pioneers and the lumbermen who are, as yet, without the luxury of good fruit, ample facilities are at hand. Not only this, but a great lake on either side gives abundant means, with easy carriage,

of reaching great markets independent of the railroad systems. Immense quantities of fruit are shipped daily from the ports along Lake Michigan from St. Joseph to Traverse City, furnishing the great distributing market of Chicago with fresh fruit, only twelve hours picked, each morning during the entire fruit season. It must be remembered also that as one traverses this shore for the 200 miles of the belt, he will find in all the perishable fruits, there is no danger of disastrous competition in the markets, because of the variation in date of ripening; while the purchaser of these fruits in the markets reaps the benefit of an extended season for each variety.

SOILS.

In the whole of Michigan one can certainly find the exact character of soil he seeks, for every shade of variation seems to be represented. Mistaken notions have obtained, at different times, concerning the soil upon which Michigan peaches are grown; in truth the remark has often been made that "up in Michigan you grow peaches on your sandy land that will grow nothing else." We can assure people at the outset that good peaches are only grown upon good land. The fruit belt is not uniformly sandy, and is by no means poor land. Upon the blowing sands where dunes are formed, it is common to find the most thrifty trees bearing luscious fruit in large quantity. Such land cannot be poor. It is also true that in many localities heavy soil can be found immediately upon the shore. In the interior the best fruit lands are clay and sandy loams, and, if the location pleases the purchaser, there is little doubt but he can obtain the quality of soil that will satisfy his taste.

The low lands, in many places in which vegetable matter predominates, are being utilized by the horticulturist, and often are very valuable when fitted for market gardening or cranberry culture.

CHEAP LANDS.

The almost fabulous prices at which well developed fruit farms have exchanged hands in western Michigan have led many to believe that it requires a large investment to enter the realm of successful fruit culture. It is only in cases where orchards have come into successful bearing and are returning a large income that the lands command extravagant prices. The fruit region of Michigan is extensive, and only a small part of the land available for the production of even the more tender fruits has been improved. As good locations can be secured to-day at rates varying from ten to twenty-five dollars per acre, as those which have exchanged hands at from $200 to $1,000 dollars per acre after the plantations were in full bearing.

Those who contemplate building homes in our State should give time to their selection. A few weeks spent in examination of locations and prices will, in the end, be money in the pocket.

It is impossible, in a short paper, to give much light concerning special localities, but by means of recent correspondence we have gathered some locality statements which will answer the questions that are most commonly asked.

MONROE COUNTY.

Monroe county is at the head of Lake Erie, and along its shores are the most extensive and successful vineyards in the State. In this county more grape wine is produced than in all the rest of the State. A large nursery interest centers at Monroe city, and excellent pears are grown which find a ready market, at high prices, in the large markets of Detroit and Toledo. Railroad and water communication makes this an exceptionally good point for the market horticulturist. The calcareous soil gives a higher quality to the grape than in most other places in the State. Wine makers give two or three cents more per pound for grapes grown on this lime soil than for the average grapes in the market.

BRANCH, HILLSDALE AND LENAWEE.

The above named counties raise excellent apples and pears, and upon the high lands peaches are grown nearly every year. These counties are upon a high level, and the streams flow rapidly, giving good land and atmospheric drainage. This section is an old settled farming country in which all ordinary fruits do well. The inhabitants are cultured, and farmers' clubs, horticultural and agricultural societies flourish there; it is a region of pleasant homes.

ST. JOSEPH AND CASS.

This is the region of large farms, and horticulture is only an accompaniment of

farm life, although in Cass county are several extensive orchards which are made very profitable. Notably one farm, that of B. G. Buell, of Little Prairie Ronde, produces the finest Northern Spy and Red Canada apples that go into the Chicago market.

BERRIEN.

A correspondent who is thoroughly acquainted with Berrien county remarks that "Nature evidently intended this region for a great fruit garden to supply the luxuries of the palate to the denizens of the western prairies." In this county dwell the pioneers of our commercial fruit growing, and here have been grown, within the last quarter century, peaches, pears, and small fruits that would rival any that have been placed in the world's markets. All that is needed is a proper label and the famous fruits of California can be obtained in Berrien county. Apricots, nectarines and figs are grown here, as well as the soft shelled almond. The growing of the tender raspberries and blackberries has long been a specialty here. Three thousand acres of strawberries are now in bearing. Chicago is the great market, but the surplus in times of a flush is readily worked up by canning and drying establishments which are at hand. An extensive cranberry interest is now building up upon the low lands about Stevensville, which promises, on account of the safety from frosts, to rival any plantation in the west.

[In 1878, 1879 and 1880, there were forwarded to Chicago, by rail, on the fruit train of the Chicago and West Michigan railroad, from 16 stations of Berrien county, 253,662 half bushel packages of berries, 135,687 baskets or boxes of peaches and grapes, and 67,125 barrels of apples. During the same three years the clearances from the port of St. Joseph, in the same county, were 161,912 crates of berries, 168,630 baskets of peaches and grapes, and 38,324 barrels of apples.]

WAYNE AND WASHTENAW.

In Wayne county, about our metropolis, Detroit, the specialties are small fruits and market garden products. The soil is a rich dark loam, admirably suited to this work, and Detroit furnishes a good home market. Washtenaw has a "peach belt" of its own. Upon the high ground in this region peaches are almost as sure a crop as upon the western shore. Fruits of all kinds are grown for market here and at a good profit. The people are foremost in testing new varieties and take a great delight in the pleasures as well as profits of horticulture. There is scarcely anything but rich land in this county, and the situation of our great University and Normal School within its borders makes it an attractive place for people of education and good taste.

JACKSON, CALHOUN, KALAMAZOO.

These three counties in the same tier along the Michigan Central railroad are settled by people who pursue horticulture as an ornamental part of farming. As amateurs, they test new things and desire that their ventures may add to their information while furnishing pleasant surprises for the table. In the towns a good deal of attention is given to ornamental gardening. This is notably true of Kalamazoo, where good taste, added to a delightful location, renders this "largest village in the world" a delightful place in which to live. Kalamazoo is something of a nursery center, and small fruits, including grapes, are specialties with the horticulturists.

VAN BUREN.

This county borders on the lake; South Haven is its port. A large fruit-growing interest centers at South Haven where are located some of the finest commercial growers in the State. At Lawton and Paw Paw, upon high lands, peaches and grapes are grown of especially fine quality. The growers here seek out markets a long way off and frequently ship the tender fruits to points in northern Minnesota and Dakota. The fruit-growers here were among the first in the State to note the special adaptability of elevated lands to fruit culture. They acted upon this knowledge and have reaped a rich reward. Cheap lands in good locations are still attainable at these points, but are being rapidly picked up.

The harbor at South Haven is an excellent one and daily boats run to Chicago during the fruit-shipping season.

ALLEGAN.

Allegan is the western county in the third tier. In the shore townships peaches are grown extensively, although it is a recent occupation with the inhabitants. They found their location to be a peculiarly good one and have been developing it rapidly. There are above 4,000 acres closely planted to fruit along the shore in this county, and although most of the orchards are young, still last year (1880) 800,000 baskets of peaches were exported and above 13,000 barrels of apples. Ten thousand packages of small fruits were sold the same season. People who have confidence in the locality, and who are thrifty and observing, have settled here and are making this region one vast orchard.

In eastern Allegan two railroads cross from north to south giving excellent shipping facilities. Peaches are grown upon the hights successfully, and at Plainwell is centered a large strawberry interest. From this point immense quantities are shipped to the great markets.

INGHAM.

In this county are situated the State Capitol and the Agricultural College, and around these gather a class of inhabitants that take delight in the pleasures of horticulture. Lansing is destined to be a beautiful city. Tree planting and the embellishment of homes as evidences of the employment of horticultural knowledge interest the dwellers here. At the Agricultural College extensive experiments are performed which are calculated to interest the people of the entire State in a knowledge of methods in horticulture and the scientific information upon which they are based.

OAKLAND AND MACOMB.

In these counties are situated some of the oldest apple orchards in the State. The people of these counties can get up a creditable apple exhibit at almost any season of any year. A large apple orchard is the accompaniment of every farm, and it is usually made a very profitable accessory.

OTTAWA AND MUSKEGON.

These counties border Lake Michigan in its widest part, and each has an excellent port. From Grand Haven, in Ottawa county, there is a daily line of beautiful steamers to both Chicago and Milwaukee, the best fruit markets in the west, and the distributing markets for a vast interior. Opening into Grand River, and forming an admirable harbor, is Spring Lake, a sheet of water of rare beauty, and along the banks of which are located scores of fruit farms, each one having its dock from which the shipments for each day can be picked up. The soil about western Ottawa is sandy, but is not devoid of fertility, and muck and marl beds are common, which are vast savings banks to the fruit-grower upon which he can draw at will. This is certainly one of the most delightful places in the State for people to locate who have an appreciation of natural beauty and desire to combine the "art which mends nature" with nature herself. Peaches and grapes are the specialties on these fruit farms.

Muskegon lies just to the northward and is rapidly developing many large fruit farms. Small fruits are grown with great success, and for a market locality the growers seem to exhibit more than common interest in new sorts. A special inducement to settle about Muskegon is the pure water everywhere near the surface and the available cheap lands that can be secured.

HURON.

The country of Huron is peculiarly situated. A glance at the map will exhibit the fact that it has the longest shore line of any county in the State. Bounded on three sides by deep water, it is admirably situated as far as lake protection is concerned. The average winter temperature is that of Bloomington, Ill. From records furnished by Wm L. Armstrong of Sand Beach, during the winter of 1880–1, when in southern Michigan we had some exceptionally severe weather, –10° was the lowest point the thermometer indicated in Huron county. Frost is unknown there in autumn until a month after it has visited the interior of southern Michigan.

This is a new county, but is destined to be one of the finest horticultural sections in the State. Its marketing facilities are such as to attract the commercial grower, and the salubrious climate adapted to so wide a range of varieties will soon be found by the amateur growers.

THE SAGINAW VALLEY.

The country tributary to Saginaw and Bay City is not peculiarly adapted to any horticultural specialty, but is an admirable region for mixed husbandry in which the growth of all the hardy fruits, and all sorts of market garden products, should take a prominent place. With a rich soil, thrifty people, and a grand market which extends to the northern peninsula, there is no doubt but this is destined to be a wonderful country.

KENT.

It has been said by people accustomed to judge of such matters that Grand Rapids, the capital of Kent county, is better supplied with a variety of fresh vegetables and fruits than any city east or west. The display of horticultural products all along through the season is certainly a credit to the skill of the people engaged in horticulture in that region. Large peach orchards within twelve miles of the city are in full bearing this year (1881), even although the entire crop of the country is very meager. The State Horticultural Society had its beginning here, and its successful record is largely due to the people of this locality, who have contributed freely of their time and means to its upbuilding.

IONIA AND MONTCALM.

Lying east of Kent are the counties of Ionia and Montcalm. In the former are scattered some of the most enthusiastic fruit-growers in this State. Situated too far from the lake to be immediately influenced by it, still upon the hights of ground even peach culture is successfully prosecuted. It is true of the latter county that its northern limit is about the boundary of the successful culture of the less hardy varieties in the interior of the State; but a large population settling to the north furnishes an admirable market near at hand for all the surplus fruit of Montcalm.

OCEANA, MASON, MANISTEE, BENZIE.

These four counties lie along the Michigan shore next north of Muskegon. Each has its lake harbor, and, although less developed than any of the counties before named, still the growing of fruit has become a leading industry in many locations. The finest plums in the world are grown here. Intelligent growers are awakening to the possibilities of this region, and great fruit farms are being planted. A glance at the map will suffice to show that portions of Oceana and Mason counties extend well out into the lake, giving a water protection even when the wind is directly north or south.

In all this region frozen ground is unknown. A mantle of snow drops down upon the land before severe winter weather, and remains until the danger from frosts is over in the spring.

In Manistee and Benzie the fact is especially to be noted that the soil is calcareous in its nature, and the country abounds in pure springs from which the celebrated grayling are taken in abundance. Pure water, clear air, and rich soil, with a delightful climate, make this a famous region. The Pere Marquette Railroad taps Lake Michigan at Ludington, in Mason county; the Chicago & West Michigan line reaches to Pentwater, in Oceana, and will soon be extended farther north, while the completion of a road to Manistee is certain to be accomplished this season.

GRAND TRAVERSE.

The "Grand Traverse region" includes more than a county; by the term we mean the country about the large bay of that name. The waters of the great lake, the depth of the bay, and the large area of inland water tributary to the bay, render the climate of this country peculiarly mild. Favorable locations are absolutely protected from extremes of temperature. The bay is from six hundred to one thousand two hundred feet in depth, and acts as an immense refrigerator in spring, keeping back vegetation and fruit buds until all danger of frosts is over; and, after becoming warmed up through the summer, acts as a huge warming-pan in preventing early fall frosts. The surface about northern Lake Michigan, Grand Traverse Bay, and the deep inland lakes, descends rapidly toward the water, affording ready and rapid atmospheric drainage. The soil is composed of glacial drift, abounding in all the elements of plant growth, and has perfect natural underdrainage. A layer of clay is usually within reach of tree roots, giving a good "bottom" for pear culture. By water this country has cheap freights to all lake ports and to Europe.

Apples, pears, plums, and cherries are the fruits for this region. The large fruits

are noted for their exceptionally fine flavor and keeping qualities. Grand Traverse pears and cherries are famous in the great markets of the West, and the plums, which are superb, rarely can reach the large markets for they have become so popular on the route.

The climate of this region is very healthful, and malarial diseases are scarcely known except as they are imported. The landscapes are of unsurpassed beauty, and although now through the direct communication of the Grand Rapids & Indiana Railroad it is a very popular summer resort, it is destined to become much more than this—a region of lovely, permanent homes.

THE EASTERN SHORE.

The eastern shore northward from Bay county to Cheboygan is a country in which all the superior varieties of apples, pears, plums and cherries succeed. The fact that so large a territory toward the interior receives its supplies from these shore counties gives a valuable market near at hand for all the products of the farm, the garden, and the orchard. Thrifty, cultured people are settling in this region, and are developing its natural resources very rapidly.

FRUIT TRAINS.

[The Chicago and West Michigan railroad runs a fruit train between Holland, in Ottawa county, and Chicago, during the season of shipments, affording conveniences for fruit-growers at every point from which consignments are forwarded. Between the 1st of June and the 31st of December, 1880, there were shipped from 25 stations situated in the counties of Ottawa, Allegan, Van Buren and Berrien, 124,502 half bushel packages of berries, 401,483 half bushel packages of grapes and peaches, and 57,405 barrels of apples.]

HORTICULTURAL ORGANIZATIONS.

The State Horticultural Society was organized in 1870, and is in a flourishing condition. Ten volumes of the transactions of this society have been published by the State, and it is largely due to the work of this society, and the liberality of the State in support of this work, that horticultural pursuits have been given such an impetus in the State. The State society is composed largely of auxiliary associations, which have sprung up in various places and do special locality work.

MICHIGAN FOR HOMES.

Any country that is especially adapted to horticultural pursuits is a good region in which to build a home; for the advantages which together render a region fit for successful fruit growing are those which one asks for when he seeks a place in which to settle for life. The products of horticulture are the most delightful accompaniment of a home, and in the development of some branch of horticulture, no matter what the principal occupation may be, one gets a wholesome satisfaction that softens the years and renders life more enjoyable. Michigan presents to the home-seeker a great many advantages that appeal at once to the practical good sense of those who are seeking a place in which to build up a home. A recapitulation of these advantages may be given very briefly as follows:

Michigan is practically free from debt; her public institutions are her pride, and her educational system is commended by the best educators in the country.

The agricultural advantages for mixed husbandry are of the very best; the climate is not equaled by any northern State; the air is clear, the water pure, and the variations in temperature comparatively slight.

The landscapes are beautiful, and a wide range of fruits, plants, flowers and trees, that form the accompaniments of a well embellished home, can be grown successfully.

Delightful resorts are near at hand everywhere; and a refined and intelligent people make up her present population.

Michigan has a motto upon her coat of arms—*Si quæris peninsulam amœnam circumspice:* If you wish to see a beautiful peninsula, look about you. That is no flaming advertisement of exaggerated proportions, but is a simple introduction to those who enter our borders, the apparently complimentary language of which is found by every visitor to be a truthful statement.

The old derisive songs that told of ague, marshes, rattlesnakes and wolverines as

the natural products of Michigan are not sung any more; and none visit the peninsular State who do not go away with pleasant accounts of her climate, soil, productions and people.

ACREAGE OF ORCHARDS AND SALES OF FRUIT IN 1879.

There are no statistics available exhibiting the acreage of orchards and sales of fruits later than those of 1879, and the data for that year are incomplete. The returns show, however, that besides those used in home consumption the growers in fifty-seven counties had *apples* to sell. The entire sales of the State are given as 1,831,-910 bushels, gathered from 226,849 acres of orchard. The apples of this State rank among the best fruit productions of the country for flavor and texture; some of them are unsurpassed in any market in the world.

Peaches were reported sold in forty-seven counties to the extent of 229,570 bushels, from orchards covering 13,901 acres, leaving large supplies for family use.

Grapes, for market purposes, were returned at 2,956,437 pounds, and the growth of these was distributed through fifty counties.

In other fruits, of which the largest consumption is usually in their domestic use, viz.: *cherries*, *plums*, *currants* and *berries*, the sales were reported at 161,316 bushels, the product, but much below the total product, of 64 counties.

The special report (No. 36) of the Department of Agriculture in 1881, which gave the statistics of grape culture and wine production in the United States, shows the Michigan product of 1880 in these figures:

Area of vineyards, acres	2,266
Gallons of wine produced	62,831
Value of product	$75,617

TOPOGRAPHY OF THE STATE.

For purposes of description the Lower Peninsula of Michigan may be divided by east and west parallel lines into three grand divisions, to be known as the Southern, Middle and Northern. These divisions are purely arbitrary and for convenience, and are not suggested by the conformation of the country or by any natural lines. The Southern division, embracing four tiers of counties, comprises the oldest and most developed section of the State, and its rural portions are devoted entirely to agriculture. The Middle division embraces the next three tiers of counties, and comprises what is generally known as the principal pine lumber region of the State. Where the native forests have been cleared away the country is rapidly developing agricultural resources, while lumbering enterprises are advancing northward. The Northern division is the newest and least settled portion of the State, being, in great part, unimproved.

The Upper Peninsula may, in like manner, be separated into three divisions by a line drawn due southward from Marquette bay to Green bay, and by a line drawn from the head of L'Anse bay to the head of Montreal river where it becomes the western boundary of the State. The Eastern division is principally agricultural and is mostly in a state of nature. The Middle division is conspicuous for its resources of iron which yield already enormous products. The Western division includes what is known as the Mineral Range, and is famous for its copper mines, besides possessing valuable agricultural lands.

SOUTHERN DIVISION OF THE LOWER PENINSULA.

Entering upon a more detailed description it may be said that the Southern division embraces the counties of Monroe, Lenawee, Hillsdale, Branch, St. Joseph, Cass, Berrien, Van Buren, Kalamazoo, Calhoun, Jackson, Washtenaw, Wayne, Macomb, Oakland, Livingston, Ingham, Eaton, Barry, Allegan, Ottawa, Kent, Ionia, Clinton, Shiawassee, Genesee, Lapeer and St. Clair. There are no mountains or considerable elevations in this region. The face of the country is nevertheless broken and gracefully undulating. It will be observed by consulting a map that this division is mainly drained into Lake Michigan. The water-shed is considerably to the eastward of a line equally dividing this region. The Grand, the Kalamazoo and the St. Joseph which are among the largest rivers in the State, all have their sources eastward of a central dividing line and all flow westward into Lake Michigan. The streams which flow eastward are the Raisin, Huron, Rouge, Clinton and Black. These are small rivers and drain a comparatively limited extent of country.

The divide is a tolerably well-defined line extending almost parallel with the easterly line of this section of the State and embracing the county of Hillsdale, western Lenawee, eastern Jackson and Livingston, western Oakland and eastern Genesee. Its elevation above Lake Michigan is 400 to 600 feet. There are hills in western Lenawee and eastern Hillsdale 550 to 600 feet above Lake Michigan. The summit of the divide is somewhat irregular in its course and is a broad, rolling plateau, originally oak openings. Eastward the land falls rapidly away to the flat, level country which borders on the lakes and their connecting straits. This embraces the counties of Monroe, Wayne, Macomb and St. Clair. There are indications that the shore of the waters was at one period some 20 miles inland from its present location and that the counties named were the bed of the lake when the remaining portion of this region

was dry land. The soil is rich alluvium and the original timber was very heavy oak, elm, beech, etc.

Westward of the divide the land falls away more gradually to within 20 or 30 miles of the lake. The elevation of all this central region is 200 to 400 feet above Lake Michigan. The country is diversified with hill and dale, with rich grass valleys along the streams and, for the most part, was densely covered with hard-wood forests. The Saginaw Valley touches the north-eastern portion of this division. The Shiawassee River, which is a tributary of the Saginaw, traverses Shiawassee county, and the Flint in like manner crosses Genesee. In these regions there is a perceptible falling away from the altitude of the divide to the much lower level which characterizes the whole Saginaw Valley. On these streams and in north Lapeer and St. Clair pine makes its appearance.

MIDDLE DIVISION OF THE LOWER PENINSULA.

The Middle division is composed of the counties of Sanilac, Huron, Tuscola, Saginaw, Gratiot, Montcalm, Muskegon, Oceana, Newaygo, Mecosta, Isabella, Midland, Bay, Gladwin, Clare, Osceola, Lake and Mason. This comprises the great valleys of the Saginaw and the Muskegon. The Saginaw, with its large tributaries, the Tittabawassee, Cass, Shiawassee and their branches, drains the counties of Tuscola, Saginaw, Bay, Midland, Gladwin and a large part of Gratiot, Isabella and Clare. In this division the water shed is very much nearer to Lake Michigan than it is in the southern division. It traverses in a northerly direction the counties of Montcalm, Isabella and Clare. Its altitude is about 300 feet above Lake Michigan. The valley of the Saginaw, which includes its tributaries, is the lowest portion of the State. East Saginaw is but 8 feet above Lake Michigan; Midland, on the Tittabawassee, but 20 feet, and Vassar, on the Cass, but 45 feet. These streams are, therefore, somewhat sluggish and afford no water power. They are mainly used for logging purposes and have floated immense numbers of pine logs to the mills situated thereon.

The valley of the Muskegon is somewhat more elevated than the region east of the water shed; the streams are more rapid and, in some localities, furnish excellent water power.

The Huron Peninsula has a water shed of its own, eastward, however, of a central dividing line. Several small streams flow into Lake Huron, and Black river, a considerable stream, heretofore mentioned in connection with the Southern division, traverses a large part of Sanilac county before it enters St. Clair. Cass River has its sources on this divide and there are a goodly number of small streams which flow directly into Saginaw Bay. The central portion of this peninsula is an elevated plateau, rising some 400 feet in Sanilac and Tuscola counties and extending into a range of hills in the southern part of Huron. This region was at one time heavily timbered, but is now given up mostly to agriculture.

The characteristic timber of all the Saginaw and Muskegon regions was pine, though this was mixed with hardwood in many localities, while in others there were extensive tracts of oak, sugar maple, beech, hickory, etc. The soil is very fertile and is adapted to grazing and to all the cereals which are grown so successfully in the southern parts of the State. The vicinity of Saginaw bay is the great salt manufacturing region of the State.

NORTHERN DIVISION OF THE LOWER PENINSULA.

The Northern division comprises the counties of Iosco, Ogemaw, Roscommon, Missaukee, Wexford, Manistee, Benzie, Leelanaw, Grand Traverse, Kalkaska, Crawford, Oscoda, Alcona, Alpena, Montmorency, Otsego, Antrim, Charlevoix, Presque Isle, Cheboygan and Emmet. In this section is found the highest land in the Lower

Peninsula. The whole central portion rises to an elevation of 600 to 800 feet, and toward its northern extremity even to a hight of 1,000 to 1,100 feet above Lake Michigan. This elevated plateau embraces the counties of Roscommon, Missaukee, Crawford and Otsego and large portions of the counties of Ogemaw, Oscoda, Montmorency, Antrim, Kalkaska and Wexford. In the southern central portion lie Higgins and Houghton lakes, 589 feet above Lake Michigan. These lakes, which are large and beautiful bodies of water, are the source of the Muskegon river which flows thence nearly southerly through a broad, deep valley. The general aspect of this extensive central elevation is that of an undulating plain. There are few abrupt hills, but the streams have cut deep valleys which usually show precipitous banks. The chief rivers which drain this region are the Au Sable, on the east, and the Manistee on the west. The headwaters of these rivers almost mingle in Crawford and Otsego counties, the summit of the Peninsula. Flowing also from this summit eastward, northward and westward are the Thunder Bay, Cheboygan, Boyne, Boardman and other streams of less magnitude. This portion of the State has been only recently opened to settlement. Within the present year railroad extension has brought within the range of development a large tract of country hitherto practically inaccessible. The soil is generally well adapted to agriculture; the native timber is pine mingled with valuable hardwoods. In the region bordering on the lakes and on the large streams which empty into them pine lumbering operations are extensively carried on. The western portion of this division, about Traverse Bay, has become famous as a fruit-growing region. The soil seems to be specially adapted to the raising of all the common varieties of fruits in great abundance and the climatic influence of the large body of water to the westward is such as to bring them to great perfection in their season.

THE EASTERN DIVISION OF THE UPPER PENINSULA

has not been extensively explored and, with the exception of a few villages about its borders, and some settlements recently opened, is yet a wilderness. It possesses, however, a fertile soil, an equable climate, and is known to be capable of agricultural development of a high order. Its principal river is the Taquamenon which rises near the center of the St. Mary's Peninsula and flows northeastward into Lake Superior. Other streams in this region are the Munnusco, which flows eastward into St. Mary's river, and the Pine which flows southward into Lake Huron. An elevated range of lime stone hills extends across the entire southern border from Point Detour to Little Bay de Noquet. These hills rise to a height of 200 to 300 feet above the lakes, on the shores of which they sometimes appear as bold bluffs, cut into weird and romantic scenery by the action of the elements. Along the north shore of this peninsula is a similar range of hills, in some localities even more lofty and bold than those on the south shore. These extend from the vicinity of Point Iroquois westward, following the direction of the shore line and sometimes rise to an altitude of 600 feet above the lake, from which they appear as lofty headlands or perpendicular escarpments, as at Grand Sable and Pictured Rocks. The streams which break through this range are interrupted by falls, some of them 40 to 100 feet in height. The scenery is very attractive. Inland the surface of the country is quite level and for the most part heavily wooded with hardwood forests. The Manistique lakes, two in number, are considerable bodies of water near the center of this peninsula. The Manistique river flows southwestward from them into Lake Michigan. Westward of these lakes the country is flat with a gentle slope to the southward, the water shed being within six to ten miles of Lake Superior. The streams all flow southward and are somewhat sluggish in their character. The country is almost wholly undeveloped as yet, except by the recent building through it of the Detroit, Mackinac and Marquette railroad.

MIDDLE DIVISION OF THE UPPER PENINSULA.

The Middle division of the Upper Peninsula comprises what is known as the iron region. This is, along its water shed, quite wild and mountainous in its character and in its more level regions contains immense tracts of valuable pine lands. The water shed extends from the headwaters of Chocolay river north of westward nearly to Keweenaw bay and thence runs in a southwesterly directiou to the boundary of the State. This mountainous range reaches an altitude of 1,250 feet above Lake Michigan, the hills commonly being 800 to 1,000 feet in hight. Lake Michigamme lies at an altitude of 966 feet. To the southwestward of this water shed the country slopes into a gently undulating plain toward the western boundary of the State. There is, however, near this western border another range of hills known as the Menominee Range which forms a water shed between the Brulé and Menominee rivers and their tributaries and the streams which flow northward and eastward. This range does not reach the altitude of the northern water shed nor approach it in ruggedness of character. The Menominee Range and the range which constitutes the water shed extending from Marquette bay to Keweenaw bay comprise the developed iron region, which is one of the richest in the world, the hills, in some instances, being almost solid masses of iron ore. The intervening region between these ranges is an elevated and gently undulating plain, well watered and heavily timbered with pine, mingled in some instances with hard wood.

WESTERN DIVISION OF THE UPPER PENINSULA.

The Western division is characterized by a somewhat rugged and mountainous water shed beginning at Keweenaw point, which is a rocky promontory extending far into Lake Superior, and running westward nearly parallel with the shore. Mt. Houghton, near the head of the promontory, is 884 feet above Lake Superior, and the range reaches a maximum altitude of about 900 feet. From the base of the Keweenaw peninsula this water shed takes a southerly direction, uniting with and becoming the water shed of the Central division before described. West of the Ontonagon river a new range develops near the shore, trending at first southwesterly and then more directly westward. This is known as the Porcupine Mountains and the altitude is 1,000 to 1,400 feet above Lake Superior. In some places near the lake the former altitude is reached, forming mountanious and romantic scenery. In the rocky range which constitutes the Keweenaw peninsula, and thence westward to the Ontonagon river, the famous copper deposits of this region are found of which detailed mention has been made in previous pages of this pamphlet. A similar range is found running in a nearly parallel direction in Isle Royal, on the other side of the lake, some 80 miles distant, where like deposits have also been found.

The mining industry is the only one to which attention has been given in any marked degree in the Upper Peninsula. But railroad extension is now going forward rapidly in hitherto undeveloped regions and the country is opening up to profitable lumbering operations and to the successful prosecution of agriculture and horticulture.

A SKETCH FROM THE STATE GEOLOGIST.

To the Commissioner of Immigration:

It affords me pleasure to comply with your request to prepare for you a brief sketch, describing the surface character of the different parts of the State of Michigan, exhibiting in particular the agricultural qualification of such parts.

In my previously published reports on the geology of Michigan I have already

given such a description and have considered our State as one of the most prosperous agricultural States in the Union, due in part to the industrious character of our farming population as well as to the fertility of our soil and to the congeniality of our climate for all sorts of crops raised in temperate zones. The present sketch is therefore mostly a repetition of statements formerly made.

GEOGRAPHICAL CONFIGURATION OF THE STATE.

The State of Michigan consists of two different districts of a peninsular character, surrounded by great inland lakes. The so-called Lower Peninsula has its longitudinal axis in a north and south direction; it is inclosed within a horse-shoe-like arch formed by the connection of Lake Michigan with Lake Huron. The Upper Peninsula, extending in an east and west direction, is separated from the Lower by the channel connecting the two before named lakes which form its southern border; its northern side is surrounded by Lake Superior. The eastern part of the peninsula forms a comparatively narrow strip of land, whose apex is cut off from the Canadian territory by a lake arm called St. Mary's river, which forms the outlet of Lake Superior into Lake Huron, the latter being about 20 feet lower than the former.

The west side of the Upper Peninsula is connected by a broad base with the north part of the State of Wisconsin; the bed of the Menominee river and of its head branch, the Brulé river, and the bed of Montreal river are adopted as the boundary line between the two States; the Menominee and Brulé form the drainage channel southward into Lake Michigan; the Montreal river leads the waters north of the water shed into Lake Superior.

THE CLIMATE AND SEASONS.

The climate in the southern parts of the State is considerably milder than that of the northern, proportionate to their respective difference in latitude and for other reasons which have a bearing on the climatic character of countries.

In the southern parts, not only all kinds of cereals are raised in abundance and superior quality, but also apples, pears, cherries, plums, and the more delicate peach trees and grapevines are cultivated with decided success. The climate in the northern parts of Michigan is nowhere so severe as to prevent the cultivation of winter wheat and the principal ordinary farm and garden products. There is a difference of about two or three weeks in the setting in of the spring, and the same time earlier the hibernal weather sets in in the fall in the most northern parts of the State, compared with the most southern districts, but the growing season in the north parts of the State is sufficiently long to bring all the ordinary farming crops to maturity, excepting Indian corn, and even this in some seasons ripens there before the frosts appear. Potatoes planted in the northern districts not only yield prolific harvests, but are generally considered as of superior quality to the tubers raised in the south part of the State; turnips, carrots, radishes and cabbages attain in the virgin soil of those northern frontier lands a really astonishing size, rarely observable in the best manured gardens in the south.

SURFACE CONFIGURATION.

The surface of the Lower Peninsula, which has an approximate width of 200 miles from east to west and is about 300 miles in length, gradually rises in gentle undulations from both sides of the surrounding lakes towards the centre to an elevation which in the southern part is about 400 feet and never exceeds 600 feet above Lake Huron. In the northern part of it the ordinary hight of the central plateau lands is about 800 feet above Lake Huron and some summit points reach to an elevation of 1,100 feet. The outlines of those hills are always rounded and scarcely any of them are too steep

for tillage. Most of the country was originally forest land with only few interspersed prairie openings or marsh bottoms. We find also a large number of fine inland lakes from a few acres to several square miles in extent, which often form the head waters of one of the numerous creeks and rivers which flow in an east or west course either into Lake Huron or into Lake Michigan. These rivers are not large enough to be navigable, but they become very important by furnishing ample water power for mills, and particularly as transporting mediums for the logs in the lumbering districts.

FORMATION OF THE SOIL.

The soil covering the Lower and also the greater part of the Upper Peninsula is most generally formed of drift or else of alluvial material; that is to say, it is composed of more or less finely comminuted and triturated fragmental rock masses and of larger blocks, of the most various formations, transported there from the north by moving glaciers and floating icebergs, or washed to the spot by currents of water, as according to all evidences the entire country under consideration has been deeply submerged at a time subsequent to the glacier period. This loose material covers the surface of the Lower Peninsula almost universally, often amounting to a thickness of 200 and 300 feet; it has likewise in the Upper Peninsula a large surface extent.

The drift soil is pre-eminently adapted to the growth of plants; its composition of a great variety of mineral substances furnishes an inexhaustible supply of the various mineral constituents necessary for vegetable life. We find sometimes limited areas covered with a light, rather sterile, sandy drift soil; in other places a heavy but quite fertile clay soil occurs, but in most instances the drift soil in Michigan is composed of a mixture of clay with sand and gravel, which combines all the properties requisite for the production of a rich vegetation. It is easily tilled, sufficiently retentive of moisture in dry times, and porous enough in wet seasons to prevent the drowning of crops.

TRANSFORMATIONS AND POSSIBILITIES.

The southern portion of the Lower Peninsula, 40 or 50 years ago an unbroken, desolate, forest land, is now transformed into a mosaic work of carefully cultivated farms interspersed with hundreds of opulent cities and villages; the land has become very valuable and immigrants generally seek for cheaper homes than they can find there. The northern half of the Lower Peninsula is not inferior in fertility to the southern; it is only thinly populated and much of the land is in its primitive forest condition. These forests are the great stores of pine timber, which is exported from Michigan to all parts of the United States. The value of this timber has hitherto attracted the attention of wealthy, enterprising capitalists to these lands, which by their peninsular position are somewhat aside from the great highways of immigrants to the west, and few of them have stopped there to look for a home, as the access to these districts was formerly rather difficult, and moreover their reputation as being pine lands was, in the eyes of the agriculturist, a poor recommendation, for pine is generally believed to grow only on a sterile sandy soil, which is true with exclusively pine forests, but these occupy only a small part of the district, and the most valuable pine grows scattered through the hardwood lands, which form much the larger proportion of the forests and are a sure indication of a good quality of soil.

OPENINGS FOR THE ENTERPRISING.

Large tracts of this better class of land from which the pine trees have been cut but on which the hardwood is left untouched, or of fertile lands cleared of their timber, lie idle and can be bought at reasonably low prices from their present owners; there is also some government land to be had yet at the original price of $1.25 per

acre. Thousands of industrious farmers could go there and lay the foundation of a home with very little expense of money. The difficulty of access to these lands is at present totally removed, as several railroad lines intersect that country. I see no reason why in another period of 40 or 50 years this northern part of the State should not fill up with as dense a population as the southern half has done within the same time; soil and climate are nearly the same and other conditions are more favorable than ever. The first pioneers of the country had to go through all the hardships of frontier life; the settlers of the present day can begin their work in the very centre of civilized society and participate in all its advantages.

THE UPPER PENINSULA AND AGRICULTURE.

Turning our eyes from the Lower Peninsula to the Upper we find also here immense tracts of land covered with hardwood timber of unusually large size, which certainly also indicates a very rich soil. Only few, however, of the thinly scattered inhabitants of that country are found engaged in agricultural pursuits, but the few I met with doing so raised prolific crops of oats and sometimes also of wheat. Grass and potatoes are the best remunerating staple products of these farmers, and their smaller gardens with luxuriously growing peas, beans, turnips, cucumbers, cabbages, and even Indian corn and tomatoes plainly demonstrate that the climate is not too severe for the culture of all the ordinary farming products, and that even sometimes the Indian corn and the tomatoes ripen there in well protected positions.

As at present various railroads are under construction which intersect a large portion of these rich hardwood lands of the Upper Peninsula, I do not hesitate to recommend them to the attention of the immigrant farming population, and feel confident that they will not be disappointed by selecting such lands for a home, provided they are a diligent and energetic people.

Respectfully yours,

C. ROMINGER,

State Geologist.

SOIL, PRODUCTIONS AND CLIMATE.

BY R. C. KEDZIE, PROFESSOR OF AGRICULTURAL CHEMISTRY IN THE STATE AGRICULTURAL COLLEGE.

To the Commissioner of Immigration:

In compliance with your suggestion I have prepared a brief statement of some of the facts which will enable a person to make an estimate of the agricultural capabilities of our State. For any person who has visited it, and seen them, no statement of this kind is necessary, for "to see is to believe." But to those who have never visited this part of our country, and whose ears are filled with the groundless assertions of parties who are interested in hurrying the stranger to the far west a candid and reliable presentation of the natural resources and advantages of Michigan will be of real worth.

SOIL.

The soil of Michigan is of drift formation, and secures the benefits incident to this intimate intermixture of the residues from decomposition of the rock formations. A small part of the soil is prairie, but the greater portion was originally covered with a dense forest. The soil varies in composition from strong boulder-clay to light sand, shading by slight gradations from tile clay loam, to sand; but the great body of soil inclines to clay and loam, though drifting sand is occasionally found.

COMPOSITION OF SOIL.

In order to have reliable data for estimating the agricultural capabilities of our soil three years ago I gathered 31 specimens of representative soils from different parts of our State and submitted these to careful chemical analysis. Specimens of all these soils with a statement of the results of analysis are in your office for inspection by all persons interested. Some persons will not readily interpret these results of analysis, and will need some suggestions to enable them to make up their mind concerning the value of a soil.

A large portion of every soil contributes little or nothing to the plants growing on it, acting only as a mechanical support to the plant, or affording it certain conditions for moisture and heat. But there are certain other substances present in small amount in the soil which are of the greatest importance in plant growth, and without which no plant will grow and arrive at maturity. These chemicals of plant growth are *potash, lime, phosphoric acid* and *sulphuric acid.* Let us see how much of these substances must be present to make a productive soil, and how much is present in these representative soils.

(a.) *Potash.* The amount of potash in a soil is often intimately associated with the quantity of clay, but even in deep sandy soils the amount should not fall below one part in a thousand. The smallest proportion found in any of these soils was five in a thousand, and in many of them there were more than twenty parts in a thousand.

(b.) *Lime.* In sandy soils the lime should not fall below one part in a thousand, and in heavy soils five parts. In the lightest sandy soil examined there were three and a half parts of lime, in clays from six to twenty parts.

(c.) *Phosphoric acid* is most intimately associated with fruitfulness in any soil

and less than 5 parts in 10,000 of soil would be regarded as a serious deficiency, and to secure good crops 10 parts should be present even in sandy soils. The smallest amount found in any of these soils is 13 parts in 10,000, and in clay and prairie soils it amounts to 30 to 44 parts.

(d.) *Sulphuric acid* should be present in a fertile soil to the amount of 2 to 4 parts in 10,000, while the smallest found in any of these soils was 8 parts.

It is thus seen that the lightest of these soils contains enough mineral matter to sustain paying crops.

An examination of the physical properties of these soils, especially their capacity to imbibe and retain moisture, shows that most of them are capable of producing large crops.

WINTER WHEAT

can be grown in all parts of our State, and indeed Michigan is distinguished as the winter wheat State. The fact that the State averages not far from thirty million bushels of winter wheat each year, and that the average production for the whole State is 17 to 19½ bushels per acre is proof of the capability of the State in this respect Corn, oats, barley and potatoes can be raised in all parts of the State.

FORESTS.

With the exception of a few prairies in the southern part, and a few plains in the northern part of the State, Michigan was originally covered with a dense forest. The trees were mostly hard wood, consisting of oaks, elms, ashes, cherries, hickories, walnuts, maples and beeches, with some basswood, whitewood and soft pine. In some low grounds the tamarack is found. These tamarack swamps used to be held up as the especial opprobrium of Michigan, but it is now found that when cleared and drained they afford the best meadows, giving two to three tons of excellent hay to the acre. I know of some clear-headed men who have bought and subdued these tamarack swamps, and the first crop of hay yielded a net profit sufficient to pay for the land and all the improvements. They thus had good farms without cost save a shrewd foresight and the use of wide-awake brains.

Besides an inestimable blessing in the form of an abundant supply of timber and fuel, forests are a great benefit to our State in equalizing the rain fall, preventing floods, regulating temperature, and moderating the force of winds. I will again call attention to the influence of forests when I speak of the climate of Michigan.

MICHIGAN PINE LANDS.

In the central and northern parts of the State are the most celebrated pine forests of the continent, and our pine lumber has a good reputation everywhere. Many persons suppose that these pine lands are valuable only for their lumber and have no agricultural value. In this they are seriously mistaken. Our pine lands differ from the hard-pine forests of the south in the fact that *our soft pines are everywhere mingled with an abundant growth of hard-wood trees*, and such forests grow on a soil of excellent agricultural capabilities.

I had a conversation with an intelligent member of our Legislature who gave a clear statement of how the lumber camps became farms. "We went there to lumber, and then to quit: we had no more thought of farming than of flying. We planted a few vegetables in the cleared space around our lumber camps, and the yield was so remarkable that we cleared off a field and put it into grain, and the harvest was so bountiful that before we knew it we were farming. That's the way Sanilac county was settled. Here is my friend, the representative from Huron county, who will tell

you the same story for his county." And the same story can be told for a dozen counties more.

I have traveled through many of these pine districts and found that very generally the lands cleared from trees form a strong sward from the grass-seeds accidentally dropped in the soil by hay used to feed the teams employed in lumbering. Some of the lumber roads were so covered with timothy and clover as to afford a considerable quantity of hay, and one lumberman told me he had secured four or five tons of hay from the lumber-roads used the previous winter. A soil that will form a dense sward the first season from grass-seed accidentally sown by hay drawn over the road will not disappoint the husbandman.

The assumption that because a district is good for lumber it cannot be good for any thing else is most misleading. The fact that a soil can grow such a magnificent forest would justify us in assuming that it would grow grains and vegetables as well as trees. But the enormous wealth of this region in its timber and lumber has so filled the public eye that it could not see the greater wealth of its soil.

LAKES AND RIVERS AND THEIR INFLUENCE.

Michigan is surrounded by lakes on three sides, and only the south has a land border. These lakes of purest water are of such vast extent that they have well been named "the unsalted seas." The influence of such large bodies of water on west, north and east of our State, fencing us off from the great storms which ravage other portions of our continent, mitigating excessive cold and heat, and giving us the soft and balmy atmospheric characteristics of "water-climate," cannot fail of imparting an agreeable climate to the peninsular State. Geographers never tire in discoursing of Europe, honey-combed and penetrated by the sea, in contrast with the unbroken mass of Africa and Australia. The same penetration of water with its control over climate is seen in the configuration of Michigan. This relation of water, with the magnificent forests, gives a climate to our State not found elsewhere away from the sea-board.

CLIMATE.

Michigan lies in the same latitude with southern France and northern Italy. The climate differs from that of European countries in the same latitude for two reasons: 1st, this State has a mean elevation above the sea of about 800 feet, and its temperature is two degrees Fah. lower in consequence of such elevation above the sea level: 2d, like the American climate in general, the climate of Michigan partakes of the peculiarities of the *land climate*, not being modified and controlled by the warm breath of the Atlantic like western Europe. The American climate is colder on the average than that of European countries lying in the same latitude; the extremes of heat and cold are greater, the winters being colder and the summers hotter than corresponding seasons of European countries having the same mean annual temperature.

MEAN TEMPERATURE OF MICHIGAN.

The mean temperature of Lansing, (capital of the State) as determined by 18 years of continuous meteorological observations taken at the State Agricultural College, is 47°.71 Fah. or 6°.54 Reaumer. Lansing has the same mean temperature as Berlin, yet the temperature of the three summer months is the same as that of Vienna, and of its three winter months the same as Stockholm.

METEOROLOGICAL TABLE FOR MICHIGAN.

The following table gives the mean results of tri-daily observations taken at the Agricultural College for 18 years, and affords reliable data for determining the leading features of our meteorology. I know such tables are commonly passed over as dry

and unprofitable reading, but if carefully studied this table will give a good insight into the climatic conditions of our State.

MONTHS.	MEAN MONTHLY TEMPERATURE.			Percentage of Humidity; complete saturation=100.	Percentage of Cloudiness; complete observation =100.	Rain and melted snow in inches.	Snow in inches.
	Fahrenheit.	Reaumur.	Centigrade.				
January	23°.14	-3°.93	-4°.92	85	73	1.97	9½
February	24°.42	-3°.37	-4°.21	85	64	1.79	9½
March	31°.65	— .16	— .19	84	65	2.67	11
April	46°.01	6°.22	7°.78	69	55	2.65	2
May	58°.68	11°.86	14°.82	71	50	3.07	¼
June	68°.05	16°.02	20°.03	72	49	3.85	0
July	71°.81	17°.69	22°.12	76	45	3.45	0
August	69°.59	16°.71	20°.88	78	47	2.79	0
September	59°.75	12°.33	15°.43	76	49	3.00	0
October	46°.79	6°.57	8°.23	78	59	2.20	1
November	35°.20	1°.42	1°.78	85	68	2.00	5½
December	25°.38	-2°.96	-3°.68	86	76	1.87	9½
Year, means	46°.71	6°.53	8°.17	79	58	.....	.....
Year, sum	.....					31.31	48¼

WHAT IT MEANS.

Let us study this table a little and see what is the climate of our State.

Rainfall. The mean annual rainfall is a little more than 31 inches and is ample for all crops. It is very evenly distributed through the year, though a little more than half falls in the five months of most active growth, from May to October. This evenness of distribution is a very important condition of productiveness. On one hand we are saved from frequent and protracted drouths such as afflict the treeless west, and on the other hand we are spared from the excessive and sudden rainfalls where everything is endangered by inundation.

This equable rainfall in our State is one of the great blessings we receive from our forests. The water-spouts, in the prairie States, which come down with swift destruction, sweeping away flocks and herds, swallowing up in an hour the crops of the whole year, and flowing out of the country in a few hours to leave it again parched and dry, are unknown in our State. So also are the cyclones and whirlwinds which are the terror of the prairie States of the west during all the summer months, and often cause fearful destruction of property and dreadful loss of life. And so too are the "blizzards" of the western States—wind storms of great violence with tempests of snow and cold such as neither man nor beast can face for any time and yet live. To those who know the nature, frequency, and the horror of these storms of the far west, such facts are most significant. Our trees are sentinels of safety, and disarm nature of her terrors.

Snow. The average annual snowfall in the center of our State is four feet, but it is rare to find more than 12 inches of snow on the ground at any one time. The snow affords two or three months of sleighing each winter, enabling the farmer to draw logs, lumber and stone, to market his crops, and perform the heavy transportation of the year with the least draft upon his animals. The snow is also invaluable

in protecting winter wheat and meadows from damage by frost. In the northern part of our State and near the great lakes, the snow begins to fall before the ground freezes, and potatoes, turnips, etc., are left in the ground all winter without injury by frost, and are gathered in excellent condition after the snow melts in the spring. The following extract will show how the snow protected the ground last January:

"A letter from Petoskey to the Kalamazoo Gazette says: A farmer dug holes in the snow, a few days since, in which to plant fruit trees, and found the earth as free from frost as it is in summer. It was in a field of growing wheat, and he found his wheat as fresh and green as it was before the snow fell. This peculiarity of the winter season in these northern regions is undoubtedly one of the reasons why wheat yields such large crops. It does not get stunted by freezing, as it frequently does in the southern part of the State."

Humidity. By reference to the table it will be seen that the air on the average is more than three-fourths saturated with moisture. Even in the hot summer months the air generally contains 75 per cent of the amount of moisture it is capable of holding at that temperature. In other words it is devoid of burning heat in striking contrast with the scorching air of the treeless prairies of the far west.

Cloudiness. But while the air is tempered and softened by watery vapor, we are free from fogs and gloom. A fog is of rare occurrence, and our sky is usually bright and clear. The table shows that from April to November only one-half the sky is covered with clouds. Brightness and sunshine characterize our climate, and the air contains abundance of ozone.

THE FLORA OF MICHIGAN.

BY PROF. W. J. BEAL, OF THE STATE AGRICULTURAL COLLEGE, LANSING.

Two very capable and enterprising young men of Hubbardston, Ionia county, have spent much time within the past ten years in studying the Flora of Michigan. Their names are C. F. Wheeler and Erwin F. Smith.

The last volume of the State Pomological report (1880) contains a catalogue of the flowering plants and vascular cryptrogams prepared by them with a preface and full notes in connection with most of the species. To a large extent, the first part of the following article is gleaned from this catalogue.

The flora of the upper peninsula is in many respects decidedly northern, resembling in part that of British America, and in other respects that of north New England and Canada. Pines, firs, cedar, larch, junipers, elms, poplars, black ash, basswood, maples and birches are the principal trees.

The proximity of the great lakes exerts a marked influence in equalizing the temperature and the effects are marked upon our flora.

Trees like the tulip tree, (*Liriodendron Tulipifera*) paw paw, (*Asimina triloba*) red bud, (*Cereis Canadensis*) coffee tree, (*Gymnocladus Canadensis*) honey locust, (*Gleditschia triacanthos*) dogwood, (*Cornus florida*) pepperidge, (*Nyssa multiflora*) mulberry, *Morus rubra*) which belong to Ohio and Central Illinois, have crept northward, favored by the mild influence of the lake winds through the central and western part of the lower peninsula, often beyond the middle. The same explanation applies equally to the fact that many portions of the State can raise fine peaches and other fruits which seem to belong to such climates as are found in Delaware and Maryland, which are much farther south and near the Atlantic ocean.

As might be expected from the uniform surface of the lower peninsula, the flora is much alike throughout.

The sandy and stony drift of many river valleys in the lower peninsula supports a heavy growth of oak, frequently interspersed with black walnut, hickory, and white ash, while the margins of the streams, and the neighboring swamps, abound in soft maples, swamp and chestnut oak, black ash, elm, hackberry, sycamore, butternut. Willows, dogwoods, viburnums and buttonbush are common shrubs in swamps, and hazel, hawthorn, wild cherry and plum, June, berry and witch-hazel are abundant on the drier ground.

On the uplands and away from the streams clay loam and a black soil supersede the sands and gravels of the valleys. The prevailing timber here is beech and maple and oak in about equal proportions. Beech and sugar maple generally grow together, forming magnificent forests of great extent. Tamarack is a valuable timber often found in swamps of the southern part of the State. Farther north arbor vitæ, often called white cedar, takes its place.

Immense groves of large straight sound sugar maples abound in Grand Traverse county and eastward, also deep forests of hemlock and yellow birch mixed with a tall growth of striped maple, having underneath a tangled growth of ground hemlock, and under all a carpet of *Lycopodium* or club moss. In many places large tracts of upland, and swamps also, produce bushes bearing huckleberries in great abundance.

In many portions of the State, north of the central, large quantities of fine blackberries and raspberries are produced.

The pine country proper lies between the two tracts described and affords the leading lumber in the markets. There are two species, *Pinus strobus*, (white or soft pine,) and *P. resinosa*, (red or Norway pine), which furnish all the pine lumber.

In the remaining portion of this paper, I have gleaned freely from my report on the Forests of Michigan at the centennial exposition, printed in the Board of Agriculture and in the Pomological Reports of our State in 1875.

Hickory of three species of the best quality grows in the southern part of the State. Chestnut is found in the southeastern part, and grows well when planted in many other portions. The canoe birch is abundant northward; also arbor vitæ in the swamps. The latter is very valuable for telegraph poles and fence posts.

Red cedar in limited quantity is found about lakes and along streams. With cultivation it grows quite rapidly.

THE MOST COMMON TREES OF THE STATE

are beech and sugar maple. They are all over the southern peninsula on what is known as timbered land. Much of the wood of sugar maple northward is curly or bird's-eye. It is very useful for furniture and certain parts of railway coaches. Large quantities are exported. The white oak is another valuable tree, found in great abundance and perfection in most parts of the southern peninsula. It disappears as we reach the pine to the north.

White ash is also widely distributed, of excellent quality and stands without a rival for farm implements, for cabinet ware, oars, floors, and for finishing off churches and dwellings. It is remarkable for its elasticity, strength and beauty. It grows rapidly and often becomes a large tree.

Black walnut is becoming scarce in Michigan where it was once abundant. It is an indication of good land. Black cherry, the timber of which is red, is common, durable and valuable. White pine has been referred to as affording all of our soft pine lumber.

Rock or white elm, *Ulmus racemosa*, is abundant and a very valuable timber on account of its toughness.

It is found in great perfection in the form of large, tall, straight trees in the central part of the southern peninsula. It is now very extensively used in making many portions of farm implements, railway cars, etc. Black ash is valuable, growing on bottom land, and is used for rails, hoops, baskets and lumber for cabinet ware.

Lumbering has, in many portions of the State, been slovenly and wastefully carried on. Much loss has been received from forest fires. Hereafter greater economy will doubtless attend the business of lumbering.

LARGE TREES.

High trees are found in some congenial spots which are a little lower than the surrounding surface. At Clam Lake an old lumberman assured me that he could furnish spars of pine 175 feet long and not over two feet through at the butt. He had cut them 200 feet long.

The following table shows the locality of some of these trees:

Common Name.	Diameter.	County.
White ash	5½ feet	Allegan.
Black ash	3 feet 11 inches	Wayne.
Yellow birch	3 feet 6 inches	Sanilac.
Black cherry	7 feet 6 inches	Oakland.
Buttonwood	8 feet 6 inches	Lenawee.
"	8 feet 10 inches	Ionia.
"	11 feet	Kent.
Black walnut	9 feet 6 inches	Hillsdale.
" "	11 feet	Allegan.
Balsam poplar	3 feet 7½ inches	Oakland.
Butternut	3 feet 9 inches	Saginaw.
Cottonwood	6 feet	Kent.
"	10 feet	
American elm	8 feet	Manistee.
Grapevine	10 inches	Lenawee.
Hickory	3 feet	Calhoun.
Honey locust	2 feet	Lenawee.
Hemlock spruce	5 feet	Allegan.
Ironwood	19 inches	Allegan.
Sugar maple	6 feet	Otsego.
Mulberry	1 foot 4 inches	Wayne.
White oak	5 feet	Allegan.
" "	7 feet	Barry.
" "	8 feet 4 inches	
Swamp oak	7 feet 8 inches	Wayne.
White pine	6½ feet	Grand Traverse.
Red cedar	3 feet	Ionia.
Sassafras	4 feet 4 inches	Allegan.
Tamarack	3 feet	Ingham.
White cedar	4 feet	
" "	5 feet	Grand Traverse.
Tulip tree	6 feet	Ingham.
" "	6 feet	Monroe.
Pear tree	3½ feet	Monroe.
Weeping willow	4 feet 6 inches	Lenawee.

For lack of accurate records no doubt we have not given the measurements of the largest trees. In Oakland, a tulip tree furnished 5,060 feet of lumber. On the Muskegon a white pine scaled nearly 9,000 feet.

GREAT VARIETY OF SPECIES.

Great Britain has about ten (10) species of trees which are natives of her soil. Michigan, with much less territory, has about ninety (90) species, nine times as great a variety. Michigan has six species of maple of tree size, a basswood, a white wood, honey locust, Kentucky coffee tree, two cherries, a pepperidge, five ashes, a sassafras, three elms, a hackberry, a mulberry, a buttonwood, black walnut, butternut, six hickories, about twelve oaks, a chestnut, a beech, five tree birches, one larch, one arbor vitæ and a red cedar. The flora of Michigan contains 1,634 species (and probably more will be found) including 165 trees and shrubs. At least 40 of the trees and shrubs are worthy of cultivation for ornament.

BEAUTY OF MICHIGAN WOODLANDS.

In the tropics of South America we should find 6,000 species on a territory where we should find 60 species in Michigan. In the tropics a forest is seldom seen to compare with the grandeur of a forest of our white pines. The mixtures of evergreens and deciduous-leaved trees, the shrubs, the autumn tints, the streams, the hills and valleys, our beautiful lakes, with the different seasons of the year, and different phases of the weather, lend a perpetual charm and freshness to our Michigan woodlands.

THE GRASSES.

There are 139 species of grasses indigenous to Michigan and 176 species of sedges. The latter are often mistaken for grasses by those who are not botanists. Many of these on plains and in marshes afford excellent pasture and hay for use by the pioneer. The State is remarkable for the excellent quality of her meadows and pastures which are seen in the older portions. These are made up of several wild and introduced species, the number of which can no doubt be largely increased with greater profit to the farmer.

INJURIOUS INSECTS.

While we have a good variety which are abundant enough for the scientist, and some kinds more abundant than is desired by farmers and fruit-growers, yet injurious insects are by no means so numerous as they are farther west and south. Entomologists assure us that we need have no fears of chintz bugs or the Rocky Mountain locust. The army worm is very seldom troublesome, and then only in limited localities.

HEALTH IN MICHIGAN.

BY HENRY B. BAKER, M. D., SECRETARY OF THE STATE BOARD OF HEALTH AND SUPERINTENDENT OF VITAL STATISTICS.

Man makes most rapid and greatest progress in that belt or zone within which the average annual temperature does not much exceed 60° F. or fall much below 45° F. As regards productiveness of soil, and consequent prosperity in food-supplies, the warmer portion of the zone is believed to be favorable, but the evidence seems conclusive that for hardiness of constitution and general and special healthfulness the coldest portion excels. The average annual temperature in central Michigan is about 46.5° F. But Michigan is exceptionally well situated for climatic influences. Extreme heat and extreme cold endanger life and health. Michigan being surrounded except on the south by large bodies of water, the temperature in summer is not as high as it otherwise would be, and in winter it is not as low. How this is favorable to human health may perhaps be better appreciated by noticing how it affects tender plant life; it is well-known that peach trees are easily killed by extreme cold, yet western Michigan is remarkable for its peach crops, made possible in this latitude by the mildness of the winter climate, modified as it is by the large bodies of water in the great lakes which nearly surround the State. This modification of the winter climate in Michigan is undoubtedly favorable to human health, by lessening the danger from inflammation of the lungs, bronchitis, influenza, etc.; and the cooling of the air in summer by the water of the great lakes is favorable by lessening the danger from diarrhea, dysentery, and the other diseases which are usually coincident with high temperatures.

Many of the diseases which most commonly kill people are spread by ignorant and careless disregard of sanitary law. Safety from such diseases is impossible in States and in communities where such disregard is common. In Michigan the people are fast becoming active in efforts for the general promotion of the public health. It was one of the first States in the Union to establish a State Board of Health; and local boards of health are now quite generally organized throughout the State. The people seem to place a high estimate upon the value of human life and health; during its last session (1881) the State Legislature passed 48 acts bearing directly or indirectly upon this subject. No man can live to himself alone,—he is greatly dependent upon his surroundings and fellow-citizens for safety to life and health. One of the greatest recommendations for Michigan as a State to *live* in is the intelligent regard of its citizens for human life and health.

The conditions in Michigan being favorable for public health and happiness,—what is the positive evidence of the general result, as shown by the death-rate? Is it possible to compare the death-rate in Michigan with that in other States and countries? Unfortunately for our present purpose, governments have nowhere paid sufficient attention to this subject of life and health to enable one to make accurate and complete comparisons of different States or countries. Considering such masses of statistics as are supplied by the census of Great Britain and of the United States, etc., this may seem strange, but it is true. The actual death-rate in these countries has not yet been learned, though for many cities it is quite closely ascertained. Censuses of States and countries collect statements of deaths which occurred during the year

preceding the census, and many deaths are omitted because of movements of relatives and friends, and the forgetfulness of other people. The omissions are probably not the same in all States, because the movements of the inhabitants are not equal. According to the United States censuses preceding that of 1880 (the results of which are not yet published) Michigan has had a very low death-rate, lower than that of most other States. After the census of 1870, the writer undertook to ascertain, by means of statistics collected for the same time by another set of men than the census marshals, what proportion of the deaths in Michigan were omitted and what the actual death-rate was. A "Life Table," similar to those employed by insurance companies was then made, showing for Michigan the average years of life after each age, and for persons of each sex and at every age the probable duration of life in Michigan. Obviously it will not do to compare a death-rate thus obtained with the death-rate of any State ascertained directly from the United States Census, because, to make my Life Table for Michigan, the deaths by the census were nearly doubled—being multiplied by 1.86; but even then the death-rate was so small that it became desirable to compare it with an exceptionally low one. Dr. Wm. Farr, the most eminent vital statistician, has constructed a Life Table for the Healthy Districts of England, concerning which he has said:—

"We have no means of ascertaining what the rate of mortality would be among men living in the most favorable sanitary conditions; otherwise observations for a term of years on a considerable number of such persons would supply a standard rate with which other rates could be compared. In the absence of such a standard, the districts of England in which the mortality rate did not exceed 17 annual deaths in 1,000 living have been selected as the basis of a new Life Table."

Comparing my Life Table for Michigan with Dr. Farr's Life Table of the Healthy Districts of England it is found that they are almost identical, for all ages except under five years and over eighty years, the exception under five years being explained in part by the fact that for the Michigan table the still-births were counted as deaths, while in England they were not; the exception over eighty years being that among both males and females the death-rate seemed to be less in Michigan than in England. The total annual death-rate in all England is about 22 per thousand inhabitants. The total annual death-rate in Michigan was, according to my Life Table, about 17.4 per thousand inhabitants. The inhabitants of Michigan now number nearly 1,700,000. In that number of people the difference between a death-rate of 22 and one of 17.4 per thousand amounts to over 7,500 lives; and, according to the Michigan Life Table, this number of persons are saved in each year over what would die if the death-rate in Michigan equaled that in all England.

THE STATE WITH REFERENCE TO MALARIOUS DISEASES.

BY HENRY F. LYSTER, A. M., M. D., PROF. OF THEORY AND PRACTICE OF MEDICINE, MICHIGAN COLLEGE OF MEDICINE, MEMBER STATE BOARD OF HEALTH, ETC.

Is there an exceptional prevalence of malarious diseases in Michigan? It can be truthfully answered that there is not. This statement may be verified by a review of the statistics of disease in this and in the neighboring States, and by studying the well observed laws which govern the development of malaria. Lorin Blodgett, in his valuable work, The Climatology of the United States, 1857, says: "Malarious fevers are found where the temperature is elevated in a moist atmosphere, and where a comparatively rapid decomposition of organic matter is as a consequence taking place." The temperature of the atmosphere in Michigan is not so elevated as it is in the

neighboring States, and the amount of moisture is less than in any State lying east of the Mississippi river, and as a consequence the decay of vegetable matter is not so rapid as in districts lying south of us, so that the climatological conditions are not so favorable for the production of malaria.

Malarious diseases, such as intermittent fever, agues, malarial dysentery, autumnal fevers, typho-malarial fevers, are more prevalent as we approach the tropics, and diminish in importance as we go north. Diseases of the above types are decidedly limited both in amount and severity in the northern two-thirds of the State on account of its climatology, and in the remaining third, containing nine-tenths of the population, they have been in a great degree removed, and largely mitigated in their effect, by the general improvement of the country, and particularly by drainage. It has been estimated that malarious diseases have diminished seventy-five per cent from these causes in the last twenty years.

Lorin Blodgett, in the work above cited, states that "while a few cases will be found in the vicinity of the lakes from which the Mississippi river rises in lat. 47° and in the east in the vicinity of Montreal, it becomes an unimportant factor in disease north of lat. 45°. In the Lake region, in elevated parts of New York and New England, intermittent fevers are excluded from all districts of 1,200 to 1,500 feet elevation above the sea level, but the average limit would be nearly at the 45th parallel." Michigan lies between parallel 41°50′ and 48° north latitude, and has a central elevation of from 660 to 1,700 feet above the sea level. While the littoral margins of the State gradually fall to the lakes, which are 581 feet above the sea, the average elevation of the interior portion of the State would reach between 400 and 600 feet above the lakes in the Lower Peninsula, the extremes varying in the meridian center between seventy-five feet in a limited spot and ten or eleven hundred feet, showing an average elevation of eight hundred to one thousand one hundred feet above the tide water level.

Malarious fevers were formerly common in New England and in New York, and may now be found in alluvial lands and in the vicinity of marshes, particularly near the sea level. Climatologically malaria would now be endemic in that section, and the reasons for its removal are found in the cultivation of the country. When local conditions favor its origin in Michigan, the same conditions would generate malaria much more effectively in any locality lying between Michigan and the Gulf of Mexico. If malarial poison increases in quantity and virulence from lat. 45° north toward the south, it can be well understood, and the fact must be accepted as proven, that malaria in southern Michigan is not so general nor so destructive as it is south of the southern boundary of the State, in localities similarly situated with regard to water and drainage.

The natural surface configuration of the State favors the removal of malaria, as the country is drained and cultivated. With the exception of a narrow depression between Saginaw bay and the mouth of Grand river, the central portion of the Lower Peninsula rises in the interior to a hight of from 400 to 1,100 feet above the lakes, giving complete water sheds to the rainfall. The natural drainage by the rivers which find their way to the great lakes is very complete. The whole State has an abundance of pure water for drinking purposes which may be obtained from wells and springs. In the Upper Peninsula and in the upper half of the Lower Peninsula the clearness and purity of the water of the lakes and rivers is a matter of general remark. The drift formation, rolling in its surface configuration, composed of clay and gravelly loam, is particularly favorable for affording water of excellent quality.

With all the natural advantages of climate and location which Michigan possesses it has had in former years its malarial history, for reasons similar to those which have obtained in all new countries. To-day it is no more malarious than New York or Ohio.

Where new land is opened up, particularly if it is bottom land or alluvial deposit, there will be for a couple of years an increase in the development of malarial disease, in any portion of the State, the same as will take place in this latitude east or west. Where the natural water courses are dammed up for logging purposes and low lands are overflowed, there will be found the autumnal fevers, agues, and dysenteries which follow such flagrant violations of sanitary law.

There are certain limited districts in the Lower Peninsula where the elevation is not great, and where the proportion of marsh and bottom land is large, and where the rivers, naturally sluggish, have been dammed in their principal branches for logging purposes, the conditions of which favor the development of malaria and all its consequences.

A local Board of Health exists under a general law in every township and village in the State, and has full authority to abate nuisances injurious to the public health. By the settling up of the country, the carrying out of the laws relative to cutting county ditches, and abating nuisances, and by reclaiming overflowed lands, these districts are becoming each year more and more limited in number and extent.

THE STATE INSTITUTIONS.

In treating of the institutions of Michigan those of an educational character take natural precedence and, as introducing them, a brief sketch of the origin of the system which has been established in this State is appropriate.

THE PUBLIC EDUCATIONAL SYSTEM.

No State has, in proportion to its wealth, done more than Michigan for the support of free schools of all grades. Its educational system has its secure foundation both in the organic law of the commonwealth and in the traditions and affections of the people. Its history ante-dates the political existence of the State itself.

NATIONAL PROVISION FOR COMMON SCHOOLS.

In 1785 Congress, in an ordinance providing for the sale of lands in the territory north of the Ohio river, reserved for the support of public schools "section 16" in each township to be organized in that vast domain. Practically, this action set apart for educational uses one-thirty-sixth of all the public lands in that region. The historical "Ordinance of 1787," which provided for the government of this Northwestern Territory, expressly declared, "schools and the means of education shall be forever encouraged." In 1804 Congress, by statute, repeated its previous reservation of "section 16" for the support of the common schools; this action was confirmed in the law of 1805 organizing the territory of Michigan, and its acceptance was made one of the conditions of the ordinance of 1836 admitting Michigan into the Union. The wise policy of providing for the free education of the people, thus outlined in the enactments of the national government, found sincere and intelligent support in the pioneer settlers of the State, who came chiefly from New England and New York, and brought with them the broad views upon educational topics which had already made those communities prosperous and influential. Accordingly well-directed steps were taken at an early day to see that the liberality of Congress was made useful in the highest degree, and the foundations were laid broadly and deeply of a school system which to-day rivals that of any State or country in its completeness and its practical value.

THE ACTION OF THE STATE—PLEDGES OF ITS ORGANIC LAW.

The territorial officers, moved by this impulse, legislated repeatedly upon educational subjects, seeking to establish a university, requiring schools to be maintained in every township containing fifty or more householders, and finally framing a system of township school inspection subject to the general supervision of a Superintendent of Common Schools appointed by the Governor. Congress also, in 1826, appropriated public lands in the territory to an amount not exceeding two townships for the support of a university. Upon the admission of Michigan as a State, its educational policy was given more definite form, while the perpetuity of its infant free school system was guaranteed by the express declarations of its organic law. The State, and not each township, was then made the custodian of all the lands covered by the

"section 16" grant. Experience soon demonstrated the wisdom of this course, and Michigan realized benefits from the munificence of Congress, which it is still enjoying, but which were largely lost by some of the neighboring States which allowed each township to do as it pleased with its "section 16." Again, it was at that time decided that the proceeds of this particular grant should be applied to the support of the primary schools exclusively, and from this construction of the law there has been no departure. The original constitution of the State also declared that all grants of land for the support of schools should be "inviolably appropriated" to such purpose, and directed the Legislature to "provide for a system of common schools, by which a school shall be kept up and supported in each school district at least three months in each year." The present constitution, framed in 1850, reaffirms and broadens this guaranty in these words (article 13):

SECTION 2. The proceeds from the sales of all lands that have been or hereafter may be granted by the United States to the State for educational purposes, and the proceeds of all lands or other property given by individuals, or appropriated by the State for like purposes, shall be and remain a perpetual fund, the interest or income of which, together with the rents of all such lands as may remain unsold, shall be inviolably appropriated and annually applied to the specific objects of the original gift, grant or appropriation.

SECTION 4. The Legislature shall * * provide for and establish a system of primary schools, whereby a school shall be kept without charge for tuition, at least three months in each year, in every school district in the State.

The same instrument provides specifically for the maintenance of the university, the normal school and the agricultural college, and declares that institutions for the benefit of the deaf, dumb, blind, or insane shall always be fostered and supported.

THE PLEDGES OF THE STATE MORE THAN REDEEMED.

The legislation of this State in regard to its educational interests of all kinds has more than met the requirements of the territorial ordinances and the pledges of its organic law. Michigan has supplemented the liberal gifts of the general government by such State and local taxation as has been necessary for the development of a system of free education, embracing all grades of general education from the primary school to the highest university courses of study in literature, science and the arts, and all branches of technical and professional education with the exception of military science and theology. It has in the fullest sense "encouraged" "schools and the means of education." That this enlightened policy will be permanent cannot be doubted, for it is upheld by the traditions and laws of the State, by the valuable character of its results, and by the profoundest convictions of the popular judgment. The future settler in Michigan, however humble, will always find the door of the free school ready to open at his touch.

THE PRIMARY SCHOOLS.

The common schools of Michigan are the special pride of its people. They are the base of its educational system, and they constitute by far its most important part, for the instruction they supply forms the chief mental training for the every-day duties of life of the great mass of the children who come to maturity in this State.

CLASSIFICATION OF THE SCHOOLS.

These schools are known as graded and ungraded. The latter exist in the smaller districts, and preserve the chief features of the original primary school. They occupy inexpensive buildings, are under the charge of but one or two teachers, and are almost

exclusively confined to instruction in the elementary branches. The graded schools are found in the more thickly settled rural districts, and in the villages and cities. Their courses of study range from the primary department through the grammar school to the high school, and their pupils are graded in classes according to their degrees of advancement. They are generally the product of the union of one or more districts, and usually occupy a large central building, possess a corps of teachers, and are attended by several hundred children. In some of the larger cities separate edifices have been erected for the high schools, but this is not the rule. The graded school, as fully developed in Michigan, receives a child ignorant of the alphabet and in a few years fits him or her for admission to the university. The ungraded districts of Michigan were 5,963 in number in 1880, and their schools were attended by 221,403 children. The graded school districts were 389 in number in that year, but 141,153 children enjoyed the benefits of their thorough and advanced systems of instruction.

THE CHILDREN OF MICHIGAN SCHOOL-GOING.

All children between the ages of five and twenty years, of whatever race, color, or condition, are entitled to admission without charge to the public schools of Michigan in the districts in which they reside. The number thus entitled in 1880 was 506,221, and the number actually attending school was 362,556. Comparatively few children go to school at five, and the majority probably not under seven years of age, while a large percentage commence the active work of life at fifteen or sixteen. About 19,000 children attend private or denominational schools in this State. Making allowance for these deductions, the average attendance in 1880 of 362,556 out of a school population of 506,221 shows that the great mass of the children of Michigan between the ages of seven and sixteen are school-going.

THE SCHOOLS ENTIRELY FREE AND MAINLY UNDER LOCAL CONTROL.

Tuition is absolutely free to resident pupils in all the public schools, except that a fee may be required in the high schools, although the reports show no cases in which this is done. Their immediate administration is entrusted to the districts themselves and to the school office elected annually by the taxpayers. The State exercises a general supervision over the system, but does not interfere with the freedom of local action within the law. It provides for the holding of teachers' nstitutes annually in every county containing over 1,000 inhabitants; at their sessions practical instruction in the best methods of doing their work is given to the local teachers by the State Superintendent or by experienced educators of his selection.

THE SCHOOL YEAR AND THE COURSES OF STUDY.

The constitution of the State provides that a free school shall be kept at least three months in each year in each district, and the general law requires at least five months of school in districts having over thirty and less than eight hundred children of school age, and not less than nine months in districts with more than eight hundred. The courses of study in the various grades are as follows:

Primary Schools: Reading, spelling, writing, arithmetic and geography.
Grammar Schools: Reading, arithmetic, geography, United States history, grammar, spelling, writing, composition, and in many districts music and drawing.
High Schools: Grammar, arithmetic, geography, composition, algebra, history, physical geography, rhetoric, geometry, book-keeping, botany, physiology, natural philosophy, civil government, zoölogy, political economy, chemistry, astronomy, moral and intellectual philosophy, and the Latin, Greek, French, and German languages. These numerous studies are arranged in various courses, from which pupils and guardians make their selections.

As a rule four years is required for the completion of a regular course in each grade.

PUBLIC AID TO SECTARIAN SCHOOLS ABSOLUTELY PROHIBITED.

The law absolutely prohibits any application of the public moneys to the support of schools of a sectarian character, whether under the control of any religious society or made sectarian by the action of the district officers themselves.

THE REVENUE OF THE COMMON SCHOOLS.

The revenue for the support of the primary schools is derived from the following sources:

1. *The Primary School Fund.* This principally consists of the proceeds of the original "section 16" grant. Under that grant the State came into possession of 1,077,209 acres; of these lands there had been on September 30, 1880, over 650,000 acres sold at an average price of $4.50 per acre. The proceeds of these sales form one of the trust funds of the State treasury, (the character of these funds is fully explained in the pages of this pamphlet treating of State finance and taxation) and upon them the State pays interest annually at the rate of seven per cent. A law passed in 1858 also provided that one-half of the cash proceeds of the sales of swamp lands should be added to the primary school fund, and that the State should pay annual interest thereon at the rate of five per cent. On September 30, 1880, the condition of the fund, including the sums still due from purchasers, was as follows:

	Fund.	Income of the Schools.
Proceeds of sales of "section 16" lands (including about $4,000 from escheats	$2,979,230	$210,773
Half of cash avails of swamp land sales	361,719	16,181
Total	$3,340,949	$226,954

The income is paid annually by the State to the counties for distribution to the school districts according to their number of children of school age, and the money is used for the payment of teachers' wages. From the school lands still unsold and other sources enough will undoubtedly be realized to ultimately increase this fund to about $4,500,000 and to raise the interest thereon to over $300,000. The practical extinguishment of the State debt has also left that part of the specific taxes paid by corporations, which has heretofore gone into the sinking fund, to be added to the income from the primary school fund. From this source several hundred thousand dollars will be realized yearly, and the sum which the counties will annually receive from the State treasury for the support of their free schools will henceforth probably exceed $500,000.

2. *The One Mill Tax.* Each township is required to raise annually for "school and library purposes" a tax of one-tenth of a cent on each dollar of its assessed valuation, and this is apportioned among the school districts also on the basis of the number of children of school age. The amount realized from this source in 1880 was $379,758. The peculiar care of the State for its schools is shown in the fact that of all the taxes collected in any township those for school purposes, as assessed and without reference to the amount collected, must be paid into the district school fund before any money is disbursed except for township expenses. It has occasionally happened that these two objects have absorbed all the collections in a township, leaving nothing for the county or the State.

3. *Local or district school taxes.* These are voted by the people of each district,

or by the school boards elected by them, under certain restrictions imposed by law with the view of preventing extravagance. The amount of these taxes in all the districts in 1880 was $2,074,073. The total taxation in Michigan for primary school purposes in 1880 was $2,453,831, or about $1.50 per capita of the population, and but about three-tenths of a cent on a dollar of the assessed valuation of the State.

4. *Miscellaneous.* Considerable sums are received annually from the tuition fees of non-resident pupils, from the dog tax and from various miscellaneous sources, their amount in 1880 being $321,246.

The total sum realized for school purposes from all sources in the State in that year was slightly less than $3,000,000.

THE STATISTICS OF THE SCHOOL SYSTEM.

The growth of the primary school system of Michigan is shown, and the essential facts of its present condition are given, in this table:

Growth and Condition of the Primary Schools of Michigan.

YEAR.	No. of Districts.	No. of School Houses.	No. of Teachers.	No. Attending School.	Average No. of Days of School.	Total Expenditures.	Value of School Property.
1836	55	.....	.....	2,377	.....	.....	.....
1840	1,506	.....	.....	47,901	.....	.....	.....
1850	3,097	.....	4,087	110,478	.....	.....	.....
1855	3,514	.....	5,074	142,307	110	.....	.....
1860	4,087	.....	7,921	193,107	124	.....	$1,633,647
1865	4,474	.....	8,792	228,629	124	$1,047,173	2,355,982
1870	5,108	5,110	11,014	278,686	138	2,789,554	6,234,797
1875	5,706	5,787	12,478	343,931	138	3,526,362	9,115,354
1880	6,352	6,400	13,949	362,556	150	3,109,915	8,977,844

NOTE.—Where the blanks occur in this table no reports were collected in the years named.

THE SCHOOL HOUSE TO BE FOUND EVERYWHERE.

The report of the Superintendent of Public Instruction for 1880 showed that every organized county in this State (Isle Royal and Roscommon alone not being heard from), however sparsely settled, was provided with school houses, and that none of them failed to maintain school during the preceding year. The log school house speedily takes its place by the cabins of the pioneer settlers on the edge of the wilderness; serviceable frame structures abound among the improved farms of the older counties; and there is no considerable city or village within the boundaries of Michigan which cannot point to its substantial, often beautiful, union school building as one of its most attractive features. In the larger towns such edifices are numerous; in Detroit with their sites and furniture they amounted in value in 1880 to $747,690; in Grand Rapids to $352,000; in Battle Creek and East Saginaw to $150,000; in Bay City to $145,000; in Ann Arbor to $140,500; in Flint to $127,000; in Jackson to $125,000; in Lansing to $106,000; in Adrian to $104,000; and in Saginaw and Marshall to $100,000.

A LARGE SUM WELL SPENT IN DEVELOPING A THOROUGHLY REPUBLICAN SCHOOL SYSTEM.

The total expenditures of this State since its admission to the Union for the support of its primary schools have exceeded $50,000,000, and, without claiming that there has been no extravagance or wastefulness on the part of the districts or that the existing system is free from imperfections, there is no exaggeration in asserting that this great

sum has, on the whole, been wisely expended, and that the State has had "value received" in the universal diffusion of knowledge among its people. It may be added, moreover, as a special cause of pride, that the history of the common schools of Michigan has fully justified these utterances of the first report of its first Superintendent of Public Instruction, the Rev. John D. Pierce: "Common schools are truly republican. The great object is to furnish good instruction in all the elementary and common branches of knowledge for all classes of community, as good indeed for the poorest boy of the State as the rich man can furnish for his children with all his wealth. In the public schools all classes are blended together; the rich mingle with the poor, and both are educated in company. In these schools the poor are as likely to excel as the rich, for there is no monopoly of talents, of industry, or of acquirements. Nothing can be imagined more admirably adapted, in all its bearings, to prostrate all distinctions arising from mere circumstances of birth and fortune. By means of the public schools the poor boy of to-day may be the man of learning and influence of to-morrow; he may accumulate and die the possessor of thousands; he may reach the highest station in the republic."

THE STATE UNIVERSITY.

The University of Michigan has during a score of years maintained its position as one of the first of American educational institutions, ranking as the rival of the celebrated eastern colleges with colonial histories. It is strong in the breadth of its fundamental plan, the practical usefulness of its work, the value of its contributions to the general stock of knowledge, the ample character of its equipment, the cheapness with which its advantages can be enjoyed, and its thoroughly democratic atmosphere.

ITS REMARKABLE DEVELOPMENT.

It was first opened to the public in 1841, and hence has had an active existence of forty years. Within that time its corps of three instructors has grown to eighty-five, and its list of students, which in its first catalogue contained but fifty-three names, has passed beyond fifteen hundred. Its single collegiate department has developed into three courses, while five additional departments have been established. Its solitary building, 110 by 40 feet in dimensions, has expanded into a group of handsome and spacious structures of almost half a million dollars in value. Its library now numbers 38,500 volumes with many thousand pamphlets. Originally a mere local school, unknown beyond the limits of the State, it has won an international reputation, and its rolls have borne the names of students from all parts of the United States and from many foreign countries.

ITS LOCATION, BUILDINGS, AND DEPARTMENTS.

The University is located in the city of Ann Arbor, thirty-eight miles west of Detroit on the Michigan Central railroad. Its numerous buildings are situated upon a high plateau in a *campus* of forty acres in extent; the single exception is the observatory, which occupies the summit of a natural elevation a short distance from the main grounds. University Hall is a spacious structure, crowned with a lofty dome, and containing the general offices of the institution, the instruction rooms of the collegiate department, and a large auditorium capable of accommodating 3,000 people. The other principal buildings are the Law School, the Medical College (old school), the Homeopathic Medical College, the Dental College, the Laboratory, the Hospitals connected with each of the medical colleges and the Museum. At the last legislative

session an appropriation of $100,000 was made for the erection of a large and fireproof general Library building. The University now contains the following departments:

1. The Department of Literature, Science and the Arts, embracing: *a*, the Academic Faculty; *b*, the School and Faculty of Political Science; *c*, the School and Faculty of Engineering.
2. The Department of Medicine and Surgery.
3. The Department of Law.
4. The School of Pharmacy.
5. The Homeopathic Medical College.
6. The College of Dental Surgery.

Each of these departments has its faculty of instruction, who are charged with its special management.

THE BOARD OF REGENTS.

The general control of the institution is placed by the constitution in a board of eight regents who are chosen by the popular suffrage of the State in its biennial spring elections. They hold their positions for the period of eight years, the terms of two expiring every second year.

TERMS OF ADMISSION.

All students, on entering, pay a matriculation fee which to residents of the State is $10 and to non-residents $25. This fee entitles the student to all the privileges of permanent membership. Residents are also required to pay an annual fee of $20 for incidental expenses, and non-residents one of $25. When a degree is taken a diploma fee of $10 must be paid. Board and rooms are obtainable in private families at Ann Arbor at from $3 to $5 per week; rooms without board at from 75 cents to $2 per week. Students by forming clubs can bring their expenses within the weekly range of from $1.50 to $2.50. All students are required before admission to any course to pass such an examination as will show the possession of a suitable preparation upon their part. Those who do not care to become candidates for regular degrees may take optional courses, pursuing only such studies as they may select. For ten years women have been admitted to all branches of the University on equal terms with men.

LENGTH OF TERMS.

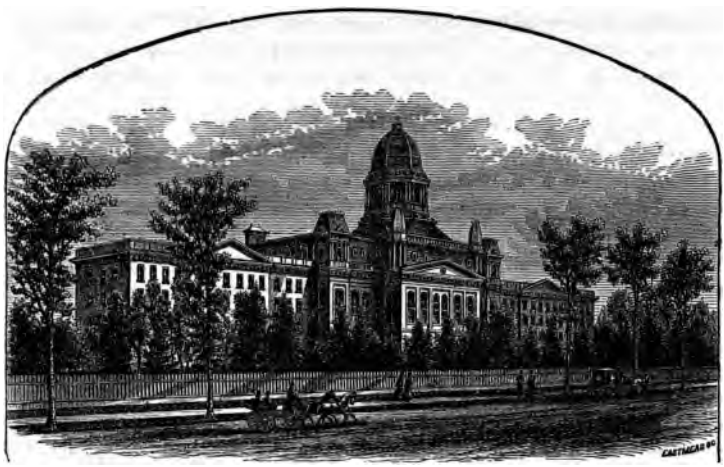
The regular term in the collegiate department covers four years, in the medical and dental schools three years, and in the law school two years; in the latter case students of sufficiently advanced attainments acquired in other colleges or in practice are given diplomas upon an attendance of one year.

THE MUSEUMS AND LABORATORIES.

The museums contain large collections in natural history, agriculture, archæology, ethnology, the fine arts, history, anatomy and materia medica. In the laboratories opportunities are provided for practical instruction in physics, chemistry, geology, zoölogy, botany, physiology, and dentistry.

THE HOSPITALS.

In the hospitals facilities are afforded to medical students for instruction by clinics. Patients are received in them and treated without charge except for medicines and board, and all persons suffering from diseases of any kind (except those of a contagious character) are granted admission.



THE UNIVERSITY OF MICHIGAN—MAIN BUILDING.

THE OBSERVATORY.

The astronomical observatory, which contains a large refracting telescope and other valuable apparatus, has acquired a wide reputation in the scientific world, largely from the discoveries of the late Prof. Watson, who was its director for many years. A small observatory, used for the purposes of instruction, is situated near the main building.

ATTENDANCE IN 1880–1.

The total enrollment of students in all departments for the session of 1880–81 was as follows:

Department of Literature, Science and the Arts	521
" " Medicine and Surgery	380
" " Law	371
School of Pharmacy	88
Homeopathic Medical College	88
College of Dental Surgery	86
Total	1,534

Of the foregoing 680 were residents of Michigan; the others came not only from other States and the territories but from foreign countries, including the British North American provinces, Nicaragua, the Bermuda islands, Bavaria, Scotland, Egypt, Burmah, and the Hawaiian islands. About ten per cent of the whole number were women.

THE UNIVERSITY FINANCES.

The total of the congressional grants to Michigan for the support of a university was two townships and three sections, and these lands have been sold at an average price of nearly $12 per acre. From them the sum of $538,978 has been realized, and this forms one of the trust funds upon which the State pays interest at the rate of seven per cent, the income realized by the university annually from this source amounting to $38,427. The State also levies yearly a tax of one-twentieth of a mill on the dollar of the assessed valuation to aid in meeting the currrent expenses of this institution, and this with the receipts from fees and a few miscellaneous sources com-

pletes its regular income. The State has in addition made large appropriations for the erection of buildings and for other permanent improvements, and for the support of special departments, meeting in these respects all clearly established needs.

THE POOR MAN'S UNIVERSITY.

This institution, with its ample equipment and its numerous courses of study, is emphatically the poor man's university. All its advantages are open at merely nominal fees to any qualified applicant. With personal economy the student can support himself during the collegiate year with but a small expenditure. Not a few of those to-day in attendance there are paying their own way without assistance from parents or others; the value of an education thus obtained need not be dwelt upon. Labor is not despised at the University, and the cases have been numerous where young men in straitened circumstances have sought and obtained employment at Ann Arbor and with the wages thus earned aided materially their struggle after knowledge. Twenty years ago the present Chief Justice of Michigan did the duties of a janitor about the law school, and thus helped to secure the diploma which introduced him into a professional career of early eminence. Among the chief sources of the University's strong hold upon the affections of the people who have so liberally supported it must be reckoned this fact, that it shares so fully in the thoroughly democratic spirit of the primary schools.

THE AGRICULTURAL COLLEGE.

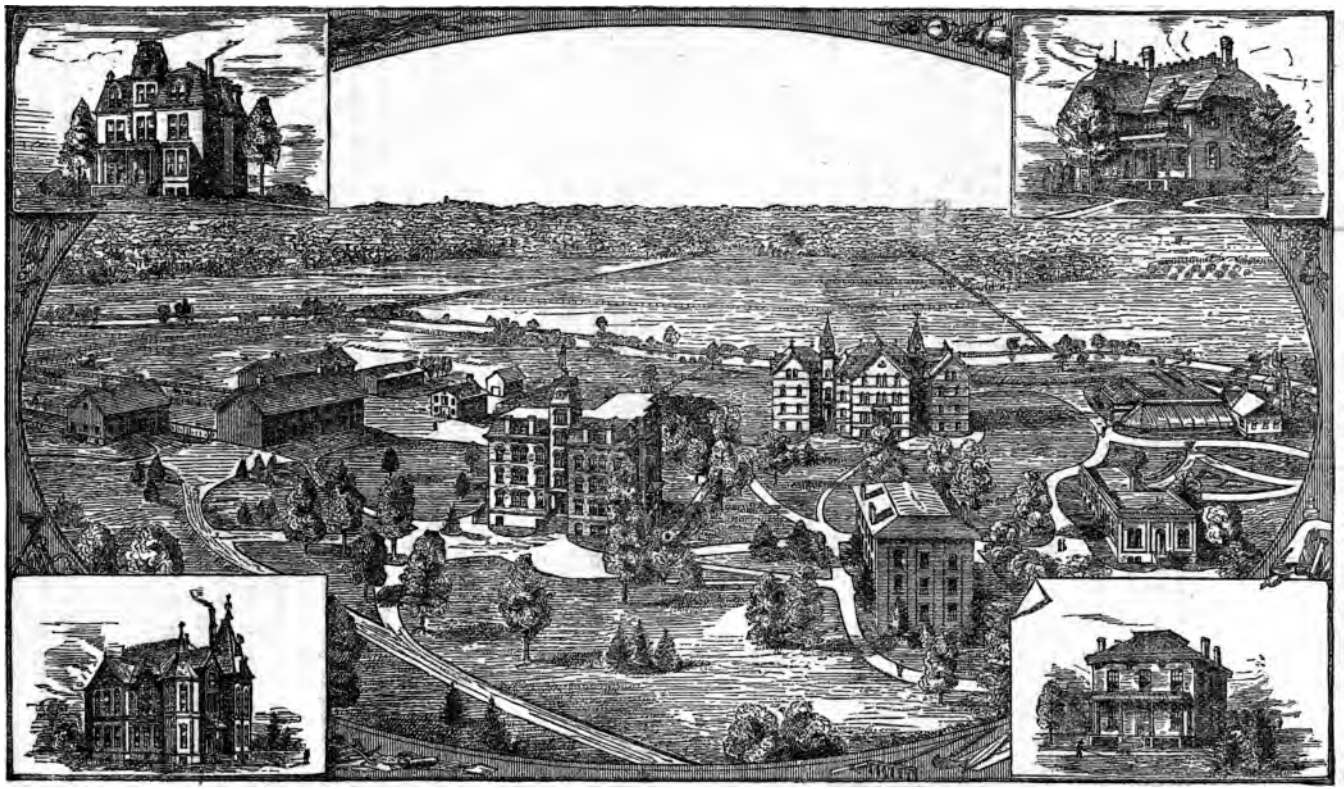
The State Agricultural College of Michigan was the pioneer institution of its kind in the United States. It has been the model for similar colleges established in other States, and to several of them it has furnished professors from among its graduates.

ITS HISTORY, LOCATION, AND BUILDINGS.

It exists in obedience to a provision in the State constitution, adopted in 1850, which required the Legislature "as soon as practicable," to establish an agricultural school. It was founded by act of the Legislature in 1855, and twenty-two sections of what were then known as "salt spring lands" were appropriated by the State for the purchase of a farm and putting the school in operation. The land bought consisted of 676 acres, as a rule heavily timbered, situated three miles east from the capitol at Lansing, on the banks of the Red Cedar river. This is now a beautiful farm with 190 acres under systematic cultivation and 110 acres of woodland pasture, well stocked, and provided with spacious barns, improved implements, an apiary, extensive lawns, fruit and vegetable gardens, fine orchards, and a large greenhouse. The College buildings, a score in number and chiefly of brick, consist of three main halls, two laboratories, dwellings for the officers, etc. They are grouped upon a slight eminence among forest trees, and to them a library and museum building is now (October, 1881) being added at a cost of $25,000. The College was first opened in 1857, and it has since constantly received aid from the State in the form of direct appropriations, as well as a supplementary grant of 7,000 acres of lands located near its farm.

THE AGRICULTURAL COLLEGE FUND.

In 1862 Congress gave to the State 240,000 acres of the public lands to constitute a permanent endowment fund for this institution. On October 1, 1881, there were 146,803 acres of these lands still unsold. The proceeds of the sales amounted on September 30, 1880, to a trust fund of $281,450; on this the State annually pays



MICHIGAN STATE AGRICULTURAL COLLEGE.

interest to the College at the rate of seven per cent. These lands were selected with a special view to their value for agricultural purposes, and for this reason command good prices; when all disposed of they will swell this endowment fund to handsome figures.

TERMS AND FEES.

The general supervision of the College is in the hands of the State Board of Agriculture whose members are mainly appointed by the Governor. It is under the direct charge of a faculty of twenty instructors. Its regular course covers four years, but students are received for a less period in selected studies. It has granted its diplomas to 244 graduates since its opening, fully one-half of whom are engaged in farming and kindred pursuits. The enrollment of students for the past year was about two hundred. The College year is divided into three terms, spring, summer and autumn, giving the long vacation in winter, during which many of the students improve the time in teaching. The dormitory and boarding in commons system prevails, board being furnished at actual cost. The charge for room and board amounts to about $2.38 per week, and the total college expenses will vary from $80 to $125 per year to each student. A matriculation fee of $5 is required on entering, after which tuition is free.

MANUAL LABOR.

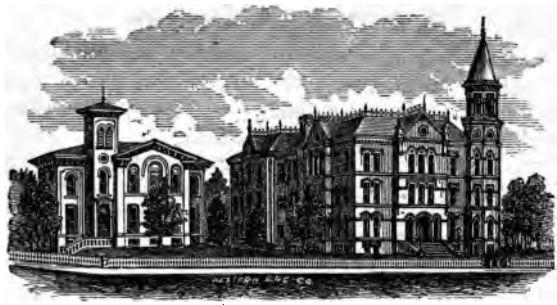
The students are required to work on the farm or garden three hours daily, and are paid for their labor according to their ability and fidelity, the maximum rate of compensation being eight cents per hour. This not only gives a practical knowledge of agriculture and preserves habits of industry, but is found to be very conducive to good health. If wise use is made of this opportunity, a student can nearly meet his current expenses by his earnings.

AN INSTITUTION OF PRACTICAL AIMS.

The College is thoroughly practical in its aims. Its classes are taught in the fields as well as in the recitation room. No time is given to the ancient or foreign languages, but thorough training in English language and literature is provided for, and especial attention is given to the practical sciences and their application. For example, it at present teaches surveying, leveling, the laying out of grounds, mechanics as applied to implements, building, stock-breeding, agricultural chemistry and horticulture. Experiments for the promotion of agriculture are systematically and continuously prosecuted, and their results are given to the public in the annual reports of the State Board of Agriculture and in lectures delivered by members of the faculty at farmers' institutes, which are now held annually in all parts of the State and have proved of much value to the farmers of Michigan. A product of one of these experiments was an analysis of soils from thirty-one different localities in the State, made by the Professor of Chemistry—Dr. R. C. Kedzie—specimens of which can be seen at the College laboratory and at the office of the Commissioner of Immigration. The influence of such an institution, working by these methods, is felt far beyond its walls, and the College is now recognized by the people of Michigan as a positive benefit to the agricultural classes and as a valuable feature of the educational system of the State.

THE STATE NORMAL SCHOOL.

This is a training and practice school designed to prepare teachers for service in the common schools.



THE STATE NORMAL SCHOOL.

LOCATION, BUILDINGS, AND TERMS OF ADMISSION.

It is located at Ypsilanti, thirty miles west of Detroit, on the Central railroad. Its buildings are but two in number, and are devoted wholly to the purposes of instruction. The last Legislature appropriated $25,000 for a training school, and this is now being built. When it is completed the value of the Normal School property will be about $150,000. Students of either sex are admitted who can pass an examination in the common English branches and will declare in writing that they propose "to devote themselves to the business of teaching." Each member of the Legislature is entitled to appoint two pupils, to whom instruction is free; all others pay a tuition fee of $10 per year. There are no dormitories connected with this institution, but board and furnished rooms can be obtained in private families at rates varying from $3 to $4 per week. Many, by "clubbing," reduce the cost of board to $2 or $2.25 per week. Others board themselves, and thereby bring their weekly expenses within $2.

The courses of study are planned with the sole aim of qualifying teachers for the efficient performance of their duties. The faculty contains thirteen members, and their work is under the general supervision of the Board of Education, whose members are elected by the popular vote of the State at large. The Normal School diploma is made in itself evidence that the person holding it is fully qualified to teach. The enrollment of students for the school year of 1879–80 contained 462 names.

THE NORMAL SCHOOL FUND.

The current expenses of the Normal School are chiefly met by appropriations by the Legislature, and these amount to about $20,000 annually. It has a small endowment fund, the proceeds of a grant from the State of twenty-five sections of "salt spring lands." These lands have been sold and the amount of the trust fund realized is $68,966, on which the treasury pays interest at the rate of six per cent ($4,310) annually. The School is an important adjunct of the educational system of Michigan. It offers an opportunity for any one of fair attainments, no matter how limited in means, to fit himself or herself for the work of teaching at very small personal expense.

THE INSTITUTION FOR EDUCATING THE DEAF AND DUMB.

This is the oldest of what may be called the charitable educational institutions of the State. The act establishing it was passed in 1848, but it was not until 1854 that it commenced operations. Originally the blind as well as the deaf mutes were received and taught within its walls, but in 1877 provision was made for a separate school for the former.

ITS LOCATION AND BUILDINGS.

The Institution for the Deaf and Dumb is located in the thriving city of Flint, situated sixty miles northwest from Detroit, at the junction of the Chicago and Grand Trunk and the Flint and Pere Marquette railways. Its grounds have an extent of 88 acres, and its three main buildings are well adapted to the uses of such an institution. The total value of the property, including furniture, is about $436,000. The governing body is a Board of Trustees appointed by the Governor, and its immediate managers are the principal, steward, matron and their assistants, a faculty of twelve teachers, and five foremen of industrial departments.

THE PRACTICAL AIM OF ITS TEACHINGS.

The aim of the instruction given is to fit the pupils for the battle of life both by developing their general intelligence and by teaching them some useful trade. Besides the studies of an ordinary school, the boys are taught farming, cabinet making, shoemaking and printing, while the girls learn sewing, knitting, printing and household work. Special instruction is of course given in the sign language and also in articulation. In the latter branch results at once surprising and gratifying have been achieved. By watching and imitating the motion of the lips in talking, many mutes have learned to speak with sufficient accuracy to make oral communication with them possible. The number of pupils in attendance during the last school year was 245.

THE GENEROUS CHARACTER OF ITS PLAN.

The State maintains this institution by liberal annual appropriations, whose total has already passed $1,000,000. No charge is made to pupils from Michigan, and the trustees are authorized to assist those in indigent circumstances to the extent of $40 annually, to be used in providing them with clothing and meeting other necessary expenses. It is made the duty of local superintendents of the poor to send to Flint all deaf mutes of tender age who may come under their care. The State also takes steps to notify the parents and guardians of such children of their right to the benefits of this institution. Certainly no community could provide more efficaciously or generously for the care and relief of its unfortunate.

THE MICHIGAN SCHOOL FOR THE BLIND.

The foregoing paragraph is also applicable to the Michigan School for the Blind, which is still managed under the general regulations in force while it was yet a part of the Flint Institution. It is now located at Lansing, the capital of the State, and in its last term received 55 pupils. So far as possible a practically useful character is given to the courses of instruction in this institution, and the children are taught broom and basket making, the girls also learning to sew, knit, and make bead work. New buildings are now in process of erection, and the wisely liberal policy of the Legislature makes it certain that this School will continue to be, what it has always been one of the most useful of the State institutions.

THE STATE PUBLIC SCHOOL FOR DEPENDENT AND NEGLECTED CHILDREN.

The State Public School of Michigan, one of the noblest and wisest charities of this or any country, was the pioneer institution of its kind. No government had, when it was established, ever attempted to care systematically for its dependent and

neglected children. This fact and the success of the Michigan experiment have attracted attention in Europe as well as in the United States, and in an address delivered within a few years before the Institute of France the eminent French statesman, Drouyn de Lhuys, said of this institution: "Behold, gentlemen, the State of Michigan, only about forty years old, has the merit of being in advance of ancient Europe in the inauguration of a new era for indigent children."

NOT AN ASYLUM NOR A REFORMATORY, BUT A SCHOOL.

The object of the School is to provide for the dependent children of the State, its pupils coming chiefly from the county poor-houses; to maintain and educate them while within its walls; and at the earliest possible moment to place them in suitable private homes. It is not an asylum nor a penal or reformatory institution. No taint of criminality attaches to it. It is a school supported by taxation, as are all the common schools, and planned to save dependent children from the evils of pauperism by giving them a temporary educational home and providing them with the means of becoming self-supporting and useful citizens.

SYSTEM OF MANAGEMENT.

The School receives dependent children of sound health and free from contagious disease between the ages of three and twelve, and it is made the duty of officers administering the poor laws to send all such children to it. The pupils are divided into what are called "families" of about thirty each, and are cared for in separate cottages under the charge of "cottage managers," these positions being filled by cultivated women. They are comfortably clothed, kept clean, and provided with wholesome food. As a means of preserving industrious habits rather than for profit each child of sufficient years is required to work three hours a day. Some labor on the farm, some in the dining room and kitchen, while others make shoes, knit, or work in the bakery, engine room or laundry. They attend school five hours per day, and receive regularly non-sectarian religious instruction.

LOCATION AND BUILDINGS.

This institution is located on a farm of 72 acres, one mile north of the city of Coldwater, 132 miles southwest from Detroit, and on the line of the Lake Shore & Michigan Southern railroad. Its buildings comprise a central structure, hospital, laundry, and nine cottages. All are neatly furnished, warmed with steam, and lighted with gas, and possess not only a substantial but a home-like appearance. On September 1, 1881, they contained 298 children, being nearly the full capacity of the institution. The value of the property is estimated at about $180,000. Its immediate officers are twenty-one in number, and its governing body is a board of control appointed by the Governor. Experience has shown that the cost of maintaining children at this School and in the county poor-houses is not materially different.

SUCCESSFUL RESULT OF THIS EXPERIMENT.

Over 500 pupils of the State Public School have been placed in families in various parts of the state with satisfactory results in a large percentage of cases. This is done under contracts requiring that the child shall be treated as one of the family and shall be sent to school at least three months in each year. In case the contract is violated, or the child proves unmanageable, return to the school follows, and another home is found or special training in obedience and good behavior is given. Supervision over these indentured children is exercised through county agents, and prompt action is taken in all cases when required by the welfare of these "wards of the State." The founding and maintenance of an institution so beneficent in its aims and so successful in its results, is in itself strong evidence of the enlightened, liberal, and humane character of the public spirit of this commonwealth.

DENOMINATIONAL AND PRIVATE COLLEGES AND SCHOOLS.

There are maintained in the State eight colleges, embracing in their curriculum of study full academic courses, which are either distinctively or quasi denominational in their character. They are as follows:

Statistics of the Denominational Colleges of Michigan.

NAME.	WHERE LOCATED.	DENOMINATION.	NAME OF PRESIDENT.	No. of Instructors.	No. of Students, 1881.	Endowment.	Value of Property.
Albion College	Albion	Methodist Episcopal	L. R. Fiske	20	217	$170,000	$50,000
Adrian College	Adrian	(a)	M. B. Taylor	9	200	125,000	125,000
Battle Creek College	Battle Creek	Seventh Day Adventist	A. McLearn	14	490	none	50,000
Detroit College	Detroit	Catholic	J. G. Walshe	10	137		25,000
Hillsdale College	Hillsdale	Free Will Baptist	D. W. C. Durgin	21	645	130,000	100,000
Hope College	Holland	Dutch Reformed	Chas. Scott	8	110	72,000	50,000
Kalamazoo College	Kalamazoo	(b)	Kendall Brooks	8	184	60,000	100,000
Olivet College	Olivet	(c)	H. Q. Butterfield	16	299	177,000	250,000

(a) Undenominational, but controlled by the Methodist Protestant church.
(b) Management Baptist, but nothing denominational in its constitution.
(c) Undenominational, but controlled and supported mainly by Presbyterians and Congregationalists.

Grand Traverse College, located at Benzonia in Benzie county, is a Congregational institution with as yet only its preparatory department established. In 1880 it had two instructors and forty pupils, and its property was valued at $40,000.

In most of these colleges the dormitory and boarding system prevails, and women are admitted to nearly all of them. Their charges are uniformly low.

PRIVATE AND OTHER SCHOOLS.

There are in Michigan a number of female schools under private control, of much merit. The Catholic church maintains parochial schools in all of the larger towns. The Michigan Military Academy at Orchard Lake, near Pontiac, is a private institution for boys, whose academic course includes instruction in military tactics, and which is annually inspected under State authority. The Michigan Medical College and the Detroit Medical College, both located in Detroit, and both controlled by physicians of the "regular school," give instruction in medicine. There are a number of private institutions throughout the State, specially devoted to commercial training. The Superintendent of Public Instruction, in his last report, gave the number of private schools in the State at 264, employing 603 teachers, and giving instruction to 18,854 pupils.

REFORMATORY AND EDUCATIONAL INSTITUTIONS.

THE REFORM SCHOOL FOR BOYS.

The history of the Reform School illustrates the progressive character of the ideas that have controlled Michigan's policy towards its institutions. It was first established as a "House of Correction for Juvenile Offenders," and was essentially penal in its character. Its inmates were sent there under sentence for various offenses and were dealt with as prisoners who were to be secured by bolts and bars and watched by guards. In 1859 its name was changed to "The Reform School," and within the

last few years all the penal features have been discarded from its management. There is now no confinement under lock and key; no walls or barred windows suggest the shame of imprisonment; for the vigilance of watchmen has been substituted the quiet surveillance of the higher officers of the institution. This transformation from a prison to a home, and this substitution of reformatory for punitive aims, have been attended by successful results. Attempts at escape are exceedingly rare; the appeal to the honor of the boys is found to arouse the better instincts of their natures, and the discipline and general tone of the institution have materially improved. This change was a long step in advance of the reformatory work of similar institutions, but there is no lack of facts to sustain the assertion of its Board of Control in their last report that the success of the experiment "is being constantly attested by assurances from county agents and parents and guardians of boys who have been submitted to our care and discharged * * and entered upon new spheres of usefulness greatly improved by their residence with us, and giving promise of lives of usefulness in the future."

This institution is pleasantly located on a hill in the city of Lansing, one mile from the capitol. Its main building is large and commodious but of no architectural pretensions. Near it are the necessary shops and barns, and three brick cottages known as "family houses," where the better class of inmates are cared for as a reward of merit, enjoying privileges which are not possible under the congregate system. A separate chapel is now being built. The farm connected with the school contains 224 acres, nearly all under cultivation. The time of the boys, with liberal allowance for amusements, is divided between work and the school-room. The only regular industry is the caning of chairs, but many find employment on the farm and in doing the tailoring, shoemaking, etc., for the school. The institution receives boys between the ages of ten and sixteen, who are sent there on conviction of some offense. They may be detained until they reach their majority, but the practice is to discharge those who give evidence of thorough reformation. The officers of the institution are fourteen in number, and they act under the general supervision of a Board of Control appointed by the Governor. The number of inmates on September 1, 1881, was 312. The annual cost of the maintenance of the institution is about $35,000, exclusive of improvements, and this is borne by the State. The value of the property is about $240,000. The evidence is abundant that the School is rendering the community constant and valuable service in reclaiming many lads from vicious habits and putting them in paths that lead to lives of usefulness and integrity.

THE REFORM SCHOOL FOR GIRLS.

This institution is in its infancy. It is designed for the care and reformation of wayward girls, through the agencies of education and industry, combined with moral and religious instruction. A majority of its Board of Control are women, as are all of its eleven officers. In its general system of management it corresponds to the Reform School for Boys, and its plan deserves the praise bestowed upon that institution. Girls sent to it by the courts or county agents will be surrounded with elevating influences, taught all kinds of domestic labor, and given a thorough English education. The ages between which commitment is permitted are seven and seventeen years, and any girl may be detained until she is twenty-one unless she sooner earns a discharge by good behavior. When the present plans are carried out, there will be a main building for general uses, surrounded by cottages whose occupants will be classified, as far as practicable, according to age and moral development. Two of the cottages are now finished (November, 1881) and occupied by twenty-two inmates. The institution is located one mile from the city of Adrian, the county seat of Lenawee county, on grounds of 40 acres in extent. It cannot be considered an experiment, and is certain to prove one of the useful institutions of the State.

BENEVOLENT INSTITUTIONS.

THE MICHIGAN ASYLUM FOR THE INSANE.

The Michigan Asylum for the Insane was established by act of the Legislature in 1848, but was not opened for patients until 1859. There are now two principal buildings, for male and female departments respectively, with total accommodations designed for about 550 patients, but having at latest reports 673. The grounds consist of 230 acres. This asylum is located at Kalamazoo, which in point of population, having 12,000 inhabitants, is entitled to rank among the cities of Michigan, but which still remains an incorporated village, and is an important railroad center.

THE EASTERN ASYLUM.

In 1873 the establishment of a second asylum was authorized, and this was subsequently located and built at Pontiac, the county seat of Oakland county. It was completed and occupied in 1878, with accommodations for 400 patients, but in September, 1881, it had 471 inmates. In 1881 the sum of $75,000 was appropriated for building two additional wings, which will give room for at least 600 patients. The site consists of 307 acres of land.

GENERAL FEATURES OF THESE INSTITUTIONS.

The cost of maintaining indigent patients at the asylums is charged to the counties from which they are sent for the first two years, after which it is a charge upon the State. There was disbursed from the State treasury on this account during the fiscal year 1880, the sum of $94,790.76, and the Auditor General in his report for that year estimated the annual cost in the near future at not less than $150,000. This item of expense is in effect only a transfer from the counties to the State. Patients, when able to pay, are charged for care and maintainance a minimum of $5 per week. Since 1875 the direct appropriations for support of the asylums have been but small, the current expenses being chiefly met by fees paid by individuals, by counties, and by the State, as already explained.

Any detailed description of these institutions is uncalled for in this work. It is sufficient to say that both are under first-class medical and business management, and have the advantage of the most approved modern appliances adapted by the best of professional skill and expert knowledge.

PROVISION FOR A THIRD ASYLUM.

The crowded condition of the Pontiac and Kalamazoo institutions led the Legislature at its last session to pass an act authorizing the building of a third asylum, for which an appropriation of $400,000 was made, $50,000 to be raised by tax in 1881, $150,000 in 1882, and $200,000 in 1883. This institution has been located at Traverse City, among the northern counties of the State, at the head of Grand Traverse bay, and its construction will be soon commenced.

PENAL INSTITUTIONS.

THE STATE PRISON AND HOUSE OF CORRECTION.

Two penal institutions are owned by the State—the State Prison at Jackson, and the House of Correction and Reformatory at Ionia, the former having on September 1st, 1881, 710 inmates, and the latter 372. The earnings of the Prison have for some years been in excess of its expenses, so that no appropriations for its maintenance

EASTERN ASYLUM FOR THE INSANE, PONTIAC.

have been required. The House of Correction is still young, and its labor is not yet fully systematized; its expenses are, therefore, still in excess of its earnings, the balance in 1880 being $15,865, showing a per cent of decrease from the preceding year. The industries of these institutions are managed under the contract system, the labor of their inmates being let to outside manufacturing establishments. The House of Correction is essentially reformatory in its management, and to it the less hardened class of criminals are sent. Much attention is also given to reformatory agencies in the Prison; the discipline there is not harsh, a reduction of the period of confinement can be earned by good behavior, the convicts are provided with suitable reading matter, and with religious instruction, and provision has recently been made for a school of three hours' duration on each week-day evening. The boards of control of both are appointed by the Governor.

THE DETROIT HOUSE OF CORRECTION.

This is not a State institution, but is still a first-class penitentiary with a national reputation for enlightened and successful management. It was built and is controlled by the city of Detroit, but is subject to periodic inspection by the State authorities. It receives persons convicted of crimes not punishable by imprisonment at Ionia or Jackson, chiefly from the city of Detroit but also from many of the counties of Michigan. It also has contracts for the receiving of United States prisoners, and of convicts from the newer States and territories which have no suitable prisons. Its inmates thus range from those whose term of confinement is sixty days to those who are serving out life sentences. It is self-sustaining, its chief industry being the manufacture of chairs. Much attention is given to the moral training of its inmates, and it may be said of the entire prison system of Michigan that it aims not merely to punish crime, but to make criminals better.

THE STATE BOARD OF CORRECTIONS AND CHARITIES.

This body, which consists of the Governor and four members appointed by him, was organized in 1871, and is charged with the general oversight of all the penal, reformatory, and benevolent institutions supported by the State. In connection with its work the Governor is also empowered to appoint an agent in each county, whose duty it is to look after all children who may be put out to places by either of the Reform Schools or by the State Public School, and also when children are arrested for vagrancy or petty crimes, if not incorrigible, to find places for them without the disgrace of a trial and sentence. The Board holds a common relation to the Institution for the Deaf and Dumb, the School for the Blind, the State Public School, the Reform Schools, the Asylums, the Prisons, and the county alms-houses, and its reports have been the source of many valuable suggestions and the moving cause in some important reforms.

THE COUNTY POOR-HOUSES.

In this connection the fact should be mentioned that fifty-six of the counties of the State maintain poor-houses for the reception and care of their paupers. These institutions, as a rule, have farms connected with them and are creditably managed.

PRIVATE CHARITIES.

All the principal towns of Michigan contain valuable private charities, supported by individual benevolence. They contribute materially to the care of the destitute and the relief of the afflicted.

GENERAL SUMMARY.

The cost of the public buildings of Michigan occupied by its various institutions and of its capitol, including the purchase of sites, construction, and the making of permanent improvements, amounted on January 1, 1881, to $4,984,885. Adding to this total the outlay for their current expenses and the $4,681,285 paid by the State for the support of the primary schools, the aggregate expenditures of Michigan for those purposes since its admission to the Union are given in this table:

Educational Institutions, including those of a Reformatory character	$8,744,475 07
Penal Institutions	1,343,556 28
Benevolent Institutions	2,877,392 10
Capitol building and offices	1,609,858 31
Total	$14,575,281 76

The institutions of Michigan are without exception well adapted to their purposes, thoroughly equipped and ably officered. Those of them which possess an educational or benevolent character must be reckoned among the important attractions which Michigan offers to settlers. All of them but the Reform School for Girls, the School for the Blind, and the third Asylum, which are not yet completed, have been wholly paid for and none of them owe one cent of debt. Those who hereafter become citizens of Michigan will enjoy their benefits without being called upon to share in the expense of their construction.

FINANCE AND TAXATION.

The State of Michigan is practically free from debt. While there are still outstanding $890,000 of its bonds bearing six and seven per cent interest and not due until 1883 and 1890, and $15,149.97 in bonds which are past due and now draw no interest but have not yet been presented for payment by their holders, the sinking fund of the treasury contains the means for the payment of every dollar of this indebtedness. Moreover, not only is the State able and willing to meet and cancel all its existing obligations, but it has repeatedly sought to purchase its bonds at a large advance upon their face value; these efforts have failed only because private owners have preferred to hold rather than sell even at a premium securities of such undoubted merit. Michigan only awaits the consent of its creditors to extinguish its entire State debt. For the payment thereof, both principal and interest, ample provision has been made, and it has thus already ceased to be a charge upon the taxpayers.

THE STATE'S CREDIT.

The credit of Michigan is of the first order. Its securities command large premiums in the investment markets of the world, in London and Amsterdam (where a considerable amount is held by capitalists who refuse to part with them) as well as in New York and Boston. Within two years the State itself has unsuccessfully offered for its outstanding bonds bearing six or seven per cent interest an advance of from eighteen to twenty per cent upon their par value. No American community possesses a better financial reputation.

THE TRUST FUNDS.

The Trust Funds of the State are not a debt proper. They are composed of the sums realized by the treasury from the sale of the lands granted for educational purposes. The proceeds of these sales have been expended by the State as received, and their amounts have been placed to the credit of five different funds, whose inviolability is guaranteed in the constitution, and upon which the State will, as trustee of the institutions to which the grants were made, pay interest annually at a fixed rate for all time to come. On January 1, 1881, the amounts to the credit of these funds, not including the sums still due from the purchasers of the lands, were as follows:

NAME OF FUND.	Rate of Interest.	Amount.
Primary School Fund	7	$2,588,876 05
" " "	5	326,650 36
University Fund	7	468,568 91
Agricultural College Fund	7	158,025 70
Normal School Fund	6	56,235 32

NATURE AND USE OF THE SPECIFIC TAXES.

For the regular payment of the interest upon these funds the constitution of the State makes ample provision by declaring that all the "specific State taxes, except

those received from the mining companies of the upper peninsula [an exception of slight importance], shall be applied in paying the interest upon the primary school, university and educational funds and the principal and interest of the State debt in the order herein recited * *." These specific taxes are levied by the State upon certain classes of corporations, and in 1880 came from the following sources:

CHARACTER OF CORPORATION.	Amount Paid.	CHARACTER OF CORPORATION.	Amount Paid.
River Improvement Companies	$2,447 97	Express Companies	1,379 22
Railroads and Street Railway Companies	504,285 62	Telegraph "	4,443 10
Insurance Companies	70,752 03	Mining "	34,683 34
Plank Road Companies	330 79	Freight, Sleeping and Palace Car Companies	1,220 51
Total			$619,542 58

This sum was nearly $300,000 in excess of the amount required in that year to pay the interest on the Trust Funds and to provide for the principal and interest of the bonded debt. With the constant natural increase in the number of corporations paying specific taxes and the present extinguishment of the State debt, the proportion of this excess is reasonably certain to increase rather than diminish, notwithstanding the fact that the steady sale of lands granted for educational purposes will continue to add to the principal of the Trust Funds for many years to come.

THE STATE CANNOT CONTRACT DEBT EXCEPT FOR WAR PURPOSES.

Again, Michigan is not only free from debt by virtue of the facts (1) that its sinking fund, already realized, is sufficient to pay every outstanding bond, and (2) that it has made ample provision for the payment with the specific taxes of the interest on all obligations not matured and of the annuities for which it is liable in the form of interest on the Trust Funds, *but it cannot involve itself in debt in the future except in case of war.* Its existing indebtedness was incurred in internal improvements in its early days and in the extraordinary expenditures made necessary by the civil war of 1861–5. By its present constitution it is absolutely prohibited from again engaging in schemes of internal improvement and from running into debt in any manner except to obtain small temporary loans to meet deficits in revenue or to provide the means for "repelling invasion, suppressing insurrection, or defending the State in time of war."

CONSTITUTIONAL BARRIERS AGAINST A STATE DEBT.

The sections of that instrument bearing upon this subject are as follows, (article 14):

SECTION 3. The State may contract debts to meet deficits in revenue. Such debts shall not in the aggregate, at any one time, exceed $50,000. The moneys so raised shall be applied to the purposes for which they were obtained, or to the payment of the debts so contracted.

SECTION 4. The State may contract debts to repel invasion, suppress insurrection, or defend the State in time of war. The money arising from the contracting of such debts shall be applied to the purposes for which it was raised; or to repay such debts.

SECTION 6. The credit of the State shall not be granted to or in aid of any person, association, or corporation.

SECTION 7. No scrip, certificate, or other evidence of State indebtedness shall be issued except for the redemption of stock previously issued, or for such debts as are expressly authorized in this constitution.

SECTION 8. The State shall not subscribe to or be interested in the stock of any company, association, or corporation.

SECTION 9. The State shall not be a party to or interested in any work of internal improvement, nor engaged in carrying on any such such work, except in the expenditure of grants to the State of lands or other property.

Manifestly, the contingencies which can make it possible for this to again become a debt-owing State are very remote. The only other States which, like Michigan, are practically free from debt are Colorado, Illinois, Vermont, and West Virginia.

THE LOW RATE OF STATE TAXATION.

Michigan is a State of low taxes. The State itself raises money by the specific taxes upon corporations and by direct taxes upon the lands, houses, and personal accumulations of its citizens. The specific taxes, which, as shown, now exceed $600,000 annually, are paid directly into the treasury by the corporations taxed, and are disposed of as follows: One half of the small amount contributed by the mining companies of the upper peninsula is used for general State expenses, while the other half is returned to the Lake Superior counties and applied by them to local purposes. The bulk of the specific taxes is, as has been stated, first used to pay the interest on the Trust Funds and to provide for the State debt, and the remainder is then added to the annual income of the primary schools. The direct taxes which are paid by the people at large are used to meet the current expenses of the State government, including the maintenance of its institutions. The tax levy of 1881 was composed of the following items:

The Tax Levy of 1881.

INSTITUTIONS, ETC.	Amount.	INSTITUTIONS, ETC.	Amount.
University—Regular income	$40,500	Reform School for Girls	$98,550
Special appropriations	74,500	House of Correction	3,868
Normal School—Cur'nt expenses	19,500	Eastern Asylum—Building	81,000
Training School	25,000	Working Capital	15,000
Ag'l College—General expenses	49,970	Michigan Asylum—Building	52,900
Experiments	1,000	New Asylum	50,000
State Public School	41,650	Repairing Capitol	5,000
Deaf and Dumb Institution	41,600	Fish Commissioners	8,000
School for the Blind	18,500	State Board of Health	2,000
Reform School—Cur'nt expenses	35,500	Military Purposes	57,272
Buildings, etc.	16,750	General State expenses	404,675
Total of the Tax Levy for 1881			$1,142,734

This sum was apportioned equally upon the $810,000,000 of real and personal property which form the present assessed valuation of the taxable wealth of this State. The current rate of taxation in Michigan for State purposes is thus but about fourteen cents on each $100. For thirteen years this average has ranged from eight to eighteen cents, and in thirty years it has not exceeded thirty-seven cents, this upper limit having been reached during the civil war, when Michigan raised and partially equipped an army of 90,000 men.

The State tax of 1881 amounted to less than 70 cents per inhabitant, and that average has never been exceeded in the history of Michigan.

STATISTICS OF LOCAL INDEBTEDNESS.

The following statistics of the local indebtedness of Michigan have been kindly furnished, in advance of official publication, by Mr. R. P. Porter, the special agent

of the U. S. Census Bureau on wealth, debt, and taxation. Each item is for the date of September, 1880:

Bonded debt of counties	$870,302
Floating " "	26,398
Bonded debt of townships	349,848
Floating " "	279,357
Bonded debt of cities and villages	6,383,401
Floating " " " "	52,899
Bonded debt of school districts	1,293,591
Floating " " "	96,081
Total	$9,351,877

A STRIKING COMPARISON.

How light the burden of outstanding local debt resting upon the tax-payers of Michigan really is appears in this table in which its rates per inhabitant and per dollar of the assessed valuation are given and contrasted with those of the three States whose returns had been officially published up to October, 1881:

Comparison of the Population, Local Debt, and Valuation of Four States.

STATE.	Population.	Total of Local Indebtedness.	Amount of Local Debt per Citizen.	Total Valuation of Taxable Property.	Amount of Local Debt per Dollar.
					Cents.
Michigan	1,636,331	$9,351,877	$5 71	$810,000,000	1.1
New York	5,083,810	*248,766,119	48 93	2,769,139,133	8.9
Ohio	3,198,239	44,654,169	13 96	1,545,746,600	2.8
New Jersey	1,130,983	53,828,248	47 59	518,617,518	10.3

*This total does not include the debt of the school districts, which would materially increase it.

Comparisons with nearly all of the States, especially the older ones, would show similar results. Michigan is more conservative in the matter of "running into debt" than the great majority of American communities, and among its people there is a growing tendency to adhere in all ordinary municipal transactions to the wholesome rule of "pay as you go."

NO BURDENSOME INDEBTEDNESS.

The existing debt of the counties, cities, villages, towns and school districts of this State represents almost without exception permanent improvements and is not the product of extravagant business management. The people have its equivalent in substantial court-houses, schools, alms-houses, jails, water-works, fire departments and systems of sewerage. Public works of this character frequently involve large cost, which is distributed by the issue of bonds through a series of years in order that the tax-payer may not be over-burdened. This policy explains the existence of the local indebtedness of this State.

Settlers or intending settlers in the farming districts or in the newer counties of Michigan will not be called upon to assume any heavy burdens from this cause. More than two-thirds of the local debt belongs directly to the cities and villages. Their share of the county and school district indebtedness is also large. Deductions on these accounts bring the debt resting directly upon the agricultural communities down to trifling proportions. It is of course not possible to make an accurate calculation on this basis, but the following statement, which is an approach to such a cal-

culation, will show its force. The debt of the cities and villages must be met by their inhabitants exclusively; the debts of the counties, towns, and school districts rest more equally, although not with absolute equality, upon the whole body of the people; they amount to but $2,968,476, or $1.81 per inhabitant.

The foregoing pages show *that the people of Michigan have fully provided for their State debt, and that the total of their local public indebtedness of all kinds does not amount to one and one-fifth cents on the dollar of the valuation of their taxable wealth.*

THE STATISTICS OF TAXATION OTHER THAN STATE.

The latest statistics obtainable concerning the local taxes of Michigan are for those assessed in 1879 and collected in that year and in 1880. They are given in this table, those of the counties, cities, and villages being procured from Special Agent Porter of the United States Census Bureau, those of the townships (which are almost but not quite complete) from the office of the Auditor General, and those of the school districts from the report of the Superintendent of Public Instruction:

County tax	$2,289,454
City and village tax	2,229,274
School district tax	2,074,073
Township tax	864,452
Total	$7,457,253

This table does not include the paving, sidewalk and private sewer taxes of the cities and villages, or the ditch taxes of counties and towns, or the taxes levied in connection with the opening of streets and roads, for the reason that all such taxes are met by special assessments upon the adjoining property which is benefited by these improvements; they do not appear in the general tax rolls, and do not form part of the public burden.

THE RATE OF LOCAL TAXATION LESS THAN ONE CENT PER DOLLAR.

These figures show that the current rate of local taxation for all purposes in Michigan is less than one cent on each dollar of the assessed value of the taxable property of the State. In the rural townships, whose tax for their own purposes is small, and which bear only their share of the county and school taxation and escape the relatively large city and village tax entirely, the rate is much smaller. It cannot be accurately determined, but must average less than half a cent on the dollar.

WHEN TAXES ARE PAYABLE.

The cities and incorporated villages of the State collect their purely local taxes at different times, but all other taxes, whether state, county, township, or school district, uniformly fall due in the month of December of each year, and are all payable at one time and place. This provision of law especially consults the convenience of the farming community, who at that time have usually received the money for the crops of the preceding season, are not busy, and can thus meet their obligations as citizens with the minimum of personal trouble.

EDUCATION THE LEADING SOURCE OF TAXATION IN MICHIGAN.

The aggregate of the taxes assessed in Michigan in 1879—obtained by adding the State tax ($1,153,096) to the total of local taxation as already given—was $8,610,349, or slightly over one cent on the dollar of the assessed valuation of 1881. Of this amount there was raised for the support of schools and educational institutions the following sums:

School district taxes	$2,074,073
One-mill school tax collected in the townships	379,758
State appropriations for educational purposes	310,388
Total	$2,764,219

It thus appears that Michigan devotes over thirty-two per cent or nearly one-third of all its taxes, State and local, to educational purposes. The State tax levy of 1879 contained more than ten times as much for education as for prisons. The proportion of the township taxes which is disbursed for the maintenance of schools or the State educational institutions is above the general average of thirty-two per cent and must as a rule amount to nearly one-half of the entire sum collected. Of all the public burdens those which when wisely applied contribute to the diffusion of popular intelligence are the most easily borne by thinking tax-payers.

LIBERAL CHARACTER OF THE EXEMPTION LAWS.

All direct State taxes and all local taxes are collected under uniform laws from the real and personal property of the people of the State. Taxes are not levied upon United States or State property, upon the property of municipal corporations used for corporate purposes, upon burial places, upon church property set apart for religious uses, or upon the personalty of charitable, benevolent, library and scientific associations, or the real estate actually occupied by them.

The State also exempts from any kind of taxation these articles:

Household furniture, including stoves put up and kept for use in any dwelling house, not exceeding in value $250.

All spinning and weaving looms and apparatus not exceeding in value $50.

All arms and accoutrements required by law to be kept by any person; all wearing apparel of every person or family.

The library and school books of every individual and family, not exceeding in value $150, and all family pictures.

To each householder fifteen sheep with their fleeces and the yarn and cloth manufactured from the same, two cows, five swine, and provisions and fuel for the comfortable subsistence of such householder and family for six months; and all musical instruments kept for use, not exceeding in value $100.

The personal and real estates of persons who, by reason of infirmity, age or poverty may in the opinion of the [assessing officer] be unable to contribute toward the public charges.

Not only is Michigan a State of low taxes, but *its taxing policy is alike equitable in character, liberal in its treatment of institutions which aim at the improvement of the condition of the people, and benevolent in its dealings with the unfortunate.*

A HEALTHY BUSINESS CONDITION.

The present condition of what may be called the business affairs of Michigan is as nearly perfect as wise laws and honest administration can make it. At the close of both the fiscal years 1880 and 1881 the books of the State treasury showed a balance to the credit of every fund, a result due to the prompt payment of light taxes by a prosperous people. The numerous State institutions are thriving. The State government is upright and economical. High salaries and extravagant expenditures do not exist, and the business of Michigan is, as a rule, managed with the skill and care with which the prudent individual guards his private interests. The fact should be again emphasized that these results—an extinguished debt, an unsurpassed credit, and a full treasury—have been secured without abandoning the policy of liberal dealing with State institutions, and without levying heavy taxes upon the people.

TRAVEL AND TRANSPORTATION.

Michigan, producing staples which must always be subject to an increasing demand, is peculiarly fortunate both in the possession of rare natural facilities for communication with the great commercial markets and in the present and prospective development of its railway system. It is surrounded upon three sides by a chain of the largest lakes in the world, affording magnificent water highways to the seaboard. All the important trunk lines of railroad in the northern States traverse its territory, or reach it with their tributaries. Railway construction is in rapid progress in both peninsulas, establishing new and valuable connections, opening broad tracts of land to settlement, and greatly enlarging the area of easy travel and of quick and cheap transportation. The State thus enjoys in an unusual degree the double advantage of competition between rival lines of railroad and between water and rail freights, with the certainty that no monopoly can ever control the carrying trade between its producers and the ocean ports.

THE RAILWAY SYSTEM OF THE LOWER PENINSULA.

The Atlantic seaboard cities are, and are likely to be, the great markets for the produce and supplies of this part of the United States, and hence the land thoroughfares of traffic of this region mainly run to east from west. There are six important lines of railroad which traverse the lower peninsula of Michigan practically in that direction. These are the Lake Shore and Michigan Southern, the Michigan Central, the Detroit, Lansing and Northern, the Detroit, Grand Haven and Milwaukee, the Flint and Pere Marquette, and the Chicago and Grand Trunk. Southeastern Michigan is also crossed by the Wabash, St. Louis and Pacific railway, connecting it with the main lines of the Wabash and of the Baltimore and Ohio corporations.

The lower peninsula has in addition a well-developed north and south railway system, which besides carrying to market the products of farms, gardens, and orchards, derives a large share of its revenue from the transportation of lumber and the business growing out of lumber operations. This comprises these roads: The Flint and Pere Marquette, which is also an important factor in the east and west system; the Jackson, Lansing and Saginaw, which, as the Mackinac branch of the Michigan Central, may be called a feeder of the same system; the Grand Rapids and Indiana, which is purely a north and south road, but has intimate relations with the wealthy Pennsylvania company; the Chicago and West Michigan, now seeking a southern connection with the Baltimore and Ohio; and the short lines of the Fort Wayne and Jackson and the Toledo, Ann Arbor and Grand Trunk.

Of the great east and west trunk lines north of the Ohio river—the Grand Trunk, the Michigan Central and the Lake Shore, connecting with the New York Central system, the Wabash, the Pennsylvania, and the Baltimore and Ohio—the first four traverse Michigan territory and the others reach it by valuable connections with friendly roads.

Nearly all of the Michigan lines named have branches or feeders spreading over the lower peninsula and interlacing with each other, so that not only is every populous rural community supplied with railroad facilities, but nearly all the cities and

villages of importance have two or more railroad outlets and the benefits of the resulting competition.

THE LAKE SHORE AND MICHIGAN SOUTHERN RAILROAD.

One of the oldest and richest of these railroad corporations is the Lake Shore and Michigan Southern extending from Chicago via Toledo to Buffalo. Its main line enters the State at the western border of St. Joseph county, and thence traverses that and the counties of Branch, Hillsdale, and Lenawee, passing into Ohio through a corner of Monroe. Upon this line, which crosses the three counties first named centrally, are the thriving towns of Coldwater, Jonesville, Hillsdale, Hudson, and Adrian. The Lake Shore has numerous branches in Michigan, all operated as feeders to the trunk line from Toledo to Buffalo. These include the roads extending from Toledo through Monroe to Detroit; from Adrian to Monroe; from the main line near Adrian through Tecumseh and Manchester to Jackson; from Banker's on the Fort Wayne and Jackson road, through Hillsdale and Manchester to Ypsilanti; from Jonesville through Homer, Albion, and Eaton Rapids to Lansing; from White Pigeon through Three Rivers, Kalamazoo, and Allegan to Grand Rapids; and from Trenton, on the Detroit river, through Monroe and Lenawee counties to Fayette, about four miles within the borders of Ohio. The total length of the Lake Shore and Michigan Southern and these several branches, within this State, is 531 miles.

THE MICHIGAN CENTRAL RAILROAD.

First of the railroads of the State in age, and perhaps in importance so far as Michigan is concerned, is the Michigan Central. Its main line extends from Chicago to Detroit, crossing the countries of Berrien, Cass, Van Buren, Kalamazoo, Calhoun, Jackson, Washtenaw, and Wayne, and counting among its stations the important towns of Niles, Kalamazoo, Battle Creek, Marshall, Albion, Jackson, Ann Arbor, and Ypsilanti. Its Air Line division extends from Niles to Jackson, passing through the counties of Cass, St. Joseph, Branch, Calhoun and Jackson, and touching Cassopolis, Three Rivers, Centreville and Homer.

There are several very important roads operated by this corporation. Chief of these is the Jackson, Lansing and Saginaw, which has become a division of the Michigan Central. It extends from Jackson to the Straits of Mackinac, a distance of 304 miles, and passes through Lansing, the capital of the State, Saginaw, West Bay City, Gaylord, and Cheboygan to Mackinac City, crossing the counties of Jackson, Ingham, Shiawassee, Saginaw, Bay, Ogemaw, Roscommon, Crawford, Otsego, and Cheboygan. A glance at the map accompanying this pamphlet will show this line, unquestionably destined to become an important artery of trade and travel, passing midway through the central part of the lower peninsula north of Saginaw Bay and opening to settlement a country hitherto largely undeveloped. It connects at the Straits of Mackinac, by a ferriage of five miles, with the Detroit, Mackinac and Marquette railroad of the upper peninsula, and also at Bay City with the Detroit, Saginaw and Bay City, another feeder of the Michigan Central, with which it forms a direct line between Detroit, the commercial metropolis of the State, and the new and rapidly growing portions of both peninsulas.

The Detroit, Saginaw and Bay City, which is also operated as a division of the Michigan Central, extends from Bay City to Detroit, passing through Vassar, Lapeer, the county seat of the county of that name, Rochester and Utica. It has branches extending from Denmark Junction through East Saginaw to Saginaw, from Vassar to Caro, the county seat of Tuscola, and from Lapeer northward nine miles to Five Lakes.

The Grand River Valley division of the Michigan Central extends from Grand

Rapids to Jackson, passing through Hastings and Charlotte, the county seats of Barry and Eaton counties. The Kalamazoo and South Haven division runs through Kalamazoo and Van Buren counties and connects the two places named, the latter an important point on Lake Michigan. A short branch also connects Niles with South Bend, Indiana.

The total length of the Michigan Central and its branches in Michigan is 903 miles, exclusive of double track, which extends for many miles along the main line.

THE GRAND TRUNK LINES.

The Chicago and Grand Trunk railroad extends from Chicago to a connection with the main line of the Grand Trunk of Canada at Port Huron. It enters the State at the southwestern border of Cass county, which it crosses centrally and diagonally, then traverses consecutively the counties of Kalamazoo, Calhoun, Eaton, Ingham, Shiawassee, Genesee, Lapeer and St. Clair. Its chief stations are Cassopolis, Battle Creek, Bellevue, Charlotte, Lansing, Flint and Lapeer.

Belonging to the same system is a line from Port Huron through Mt. Clemens, the county seat of Macomb county, to Detroit with a branch from Ridgeway through Romeo and Rochester to Pontiac, whence it will soon be extended to Jackson.

The total length of the roads in Michigan controlled by Grand Trunk interests is 320 miles, and they form part of a great thoroughfare to the Atlantic seaports, to Montreal as well to those of the United States.

THE WABASH, ST. LOUIS AND PACIFIC RAILROAD.

This is part of the great Wabash system spreading through several western States and touching the principal cities of the west and southwest. It enters Michigan from Ohio in the southeastern corner of Hillsdale county and crosses Lenawee diagonally, passing through Adrian. It also crosses corners of Monroe and Washtenaw counties, then traverses Wayne to Detroit. The total present length of this road in this State is about 80 miles. It not only connects the chief city of Michigan with the Wabash system, but at Auburn, Ind., taps the important Baltimore and Ohio road.

THE DETROIT, LANSING AND NORTHERN RAILROAD.

This line extends from Howard City, on the Grand Rapids and Indiana road, through Greenville, Ionia, Portland, Lansing, Howell, Brighton, and Plymouth to Detroit. In its course it traverses the counties of Montcalm, Ionia, Ingham, Livingston, and Wayne, and passes through parts of Clinton, Eaton, Oakland, and Washtenaw. It has a branch extending from Ionia through Stanton, the county seat of Montcalm, and Blanchard in Isabella county, to Big Rapids, the county seat of Mecosta. It also operates the Saginaw Valley and St. Louis railroad, running from Alma through St. Louis in Gratiot county to Saginaw City. With this latter road connections are made by an independent line, which is known as the Chicago, Saginaw and Canada, and runs from St. Louis through Alma and Edmore (on the Stanton branch of the main line) to Lakeview. The total length of the lines operated by the Detroit, Lansing and Northern is 258 miles, and that of the Chicago, Saginaw and Canada 38 miles.

THE DETROIT, GRAND HAVEN AND MILWAUKEE RAILROAD.

This line extends from Grand Haven, one of the principal ports on Lake Michigan and the county seat of Ottawa county, through Grand Rapids, Ionia, St. Johns, Corunna, Owosso, Fenton, Holly, and Pontiac to Detroit. It crosses the counties of Ottawa, Kent, Ionia, Clinton, Shiawassee, and Oakland quite centrally, and also passes through the southern portion of Genesee. Its total length is 189 miles.

THE FLINT AND PERE MARQUETTE RAILROAD.

The main line of the Flint and Pere Marquette commences at Ludington on the western shore, and passes through Mason, Lake, Osceola, Clare, Midland, Saginaw, Genesee, Oakland, Wayne, and Monroe counties to the city of Monroe. Among its stations are Baldwin, Reed City, Hersey, Evart, Clare, Midland, Saginaw, East Saginaw, Flint, Holly, Milford, Plymouth, and Wayne. An examination of the map will show that this is one of the important roads of Michigan, serving a large belt of new and rapidly developing country in the northern midland district and also traversing some of the oldest and richest counties. The Flint and Pere Marquette has branches extending from Manistee to Butler on the main line, from East Saginaw to Bay City, and from Flint to Otter Lake in Lapeer county. This corporation also controls and operates the Saginaw and Mt. Pleasant railroad (narrow gauge), running from Coleman on its main line in Midland county to Mt. Pleasant, the county seat of Isabella, and the Saginaw and Clare railroad connecting it with Harrison, the county seat of Clare. Its total length, including that of its branches of all kinds, is 330 miles.

THE GRAND RAPIDS AND INDIANA LINE.

This railroad extends from Petoskey in Emmet county almost due southward through the counties of Antrim, Kalkaska, Grand Traverse, Wexford, Osceola, Mecosta, Montcalm, Kent, Allegan, Kalamazoo, and St. Joseph to Fort Wayne, Indiana, where it connects with the great Pennsylvania system leading to the Atlantic coast, affording the main outlet to all southeastern consuming points. Its important stations are Cadillac, Reed City, Big Rapids, Grand Rapids, Plainwell, Kalamazoo, and Sturgis. There is a branch near its northern end connecting it with Traverse City, at the head of Grand Traverse Bay. This road is the most important of the Western Michigan lines, and has been a valuable factor in the development of the northwestern portion of the lower peninsula. Besides the branch to Traverse City, it also operates a leased line from Montieth to Allegan. The total length of road owned or operated by it in Michigan is 318 miles, and its early extension from Petoskey to the Straits of Mackinac is contemplated.

THE CHICAGO AND WEST MICHIGAN LINE.

The Chicago and West Michigan railroad traverses the important fruit belt of the western shore. Commencing at Pentwater on Lake Michigan it passes through the counties of Oceana, Muskegon, Ottawa, Allegan, Van Buren, and Berrien to New Buffalo on the Michigan Central. It has also branches from Holland to Grand Rapids, from Muskegon to Big Rapids, from Mears to Hart, from Muskegon through Grand Haven and Holland to Allegan, and from White Cloud (Newaygo county) on its Big Rapids branch, through Newaygo to Grand Rapids. Its extension north to Butler junction on the Flint and Pere Marquette line, connecting there with the Manistee branch of the latter road, is under progress. Its extension southward is also projected by a line from New Buffalo to Juanita, Ind., where it will connect with the Baltimore and Ohio system. The total length of this road and its branches is 354 miles.

THE CANADA SOUTHERN LINE.

The Canada Southern railroad extends in Michigan from Toledo to Detroit, passing through Monroe and Wyandotte. Its main line proceeds eastward from Trenton Junction, crossing the Detroit river at Grosse Isle and thence passing through Canada to Buffalo, forming one of the chief railway outlets of the State. This company also operates the short line (known as the Michigan, Midland and Canada) between St. Clair on the river of that name, and Ridgeway on the Detroit branch of the Grand Trunk. The total length in Michigan of this road and its branches is 65 miles.

THE FORT WAYNE AND JACKSON.

The Fort Wayne and Jackson railroad extends from Fort Wayne, Ind., to Jackson, entering this State at the southeastern corner of Branch county, and thence crossing Hillsdale county in a northerly direction, passing through Jonesville to Jackson. Its length in Michigan is 46 miles.

THE TOLEDO, ANN ARBOR AND GRAND TRUNK LINE.

This road is projected from Toledo to Pontiac, and is in operation at the present time to South Lyon, Oakland county. It crosses in a nearly northerly direction the counties of Monroe and Washtenaw, passing through Ann Arbor. Its total length in Michigan is 57 miles.

THE LOGGING RAILROADS.

The lumber districts of the State contain many short lines of railroad, constructed by lumbermen to carry logs from the pineries to the banks of rivers or lakes or to some point of shipment. As a rule these are private lines and used only for the business of their owners. In a few instances, however, they have been incorporated under the general laws of the State, and thus opened to the public. These latter lines, which are of full gauge, are two in number as follows: The Lake George and Muskegon railroad in Clare county connects the forests about Lake George with the Muskegon river. The Pinconning railroad extends from Pinconning on Saginaw Bay in Bay county, westward nearly to the line of Gladwin, with north and south branches near its western terminus. The total length of these lines is 30 miles.

THE NARROW GAUGE LINES OF THE LOWER PENINSULA.

The roads included in the preceding description are of the standard gauge usually employed in the railroad construction of the United States—4 feet 8½ inches—except that the track of the Grand Rapids and Indiana (not including its Allegan branch) is half an inch wider. There are also several narrow gauge lines that have been built and are operated at a much less cost than that of the standard roads, and which supply thriving towns and districts with railroad facilities. One of these is of considerable length and importance. This is the Port Huron and Northwestern, which is projected from Port Huron to Port Austin with a branch to East Saginaw, and which is already completed on the former route to Sand Beach, Huron county, and on the latter to Mayville in Tuscola county. The distance to Sand Beach is 70 miles, and the road runs almost due north entirely across the county of Sanilac and about half way through Huron. The East Saginaw line takes a northwesterly course, crossing the counties of Sanilac and Tuscola and touching northern Lapeer. The completed length of both branches is about 100 miles. This will prove a very serviceable road in developing the Huron peninsula.

The Paw Paw and the Toledo and South Haven roads make a continuous narrow gauge line of 13 miles, extending from Lawrence, near the center of Van Buren county, to Lawton, a station on the Michigan Central, through Paw Paw, the county seat of Van Buren.

The Saginaw and Mt. Pleasant railroad is a narrow gauge line operated, as has been said, by the Flint and Pere Marquette as one of its branches. The Hobart and Manistee, the Tawas and Bay County, and the Muskegon River and Rose Lake lines are logging railroads of less than standard gauges, located respectively in the counties of Lake, Iosco, and Osceola.

The St. Joseph Valley railroad is a short line which connects Berrien Springs, the county seat of Berrien county, with Buchanan on the Michigan Central. Its exten-

sion to St. Joseph on the shore of Lake Michigan is expected at an early day. Its present length is 10 miles.

All of these lines possess a gauge of three feet except the Hobart and Manistee which is six inches wider.

PROJECTED ROADS IN THE LOWER PENINSULA.

Besides the proposed extensions of the lines now in operation already noted, there are several projected roads indicated upon the map, which are considered reasonably sure to be built in the immediate future. Chief of these is the Bay City and Alpena, which is to run from some point on the Flint and Pere Marquette, or on the Mackinac division of the Michigan Central, through Bay, Iosco, Alcona, and Alpena counties, along the Lake Huron shore, to Alpena, touching the important towns of Alabaster, Tawas City, East Tawas, Au Sable, Oscoda, and Harrisville. The narrow gauge system is also to be increased by the Saginaw, Tuscola and Huron railroad, which is to be of three-feet gauge and will run from East Saginaw to Sebewaing on the shore of Saginaw bay.

THE PENINSULA WELL SUPPLIED WITH RAILROADS.

Of the sixty-seven counties in the lower peninsula fifty-one have county seats possessing railroad communications. Of the 16 county seats which have no railroad as yet, nine are lake ports and have water communication, leaving only the county seats of seven—Sanilac, Huron, Gratiot, Gladwin, Missaukee, Montmorency, and Oscoda—which have neither rail nor water outlets, and not one of these is twenty miles from a railroad station. The counties in the lower peninsula which no railroad touches are but eight in number, namely, Alcona, Alpena, Gladwin, Leelanaw, Missaukee, Montmorency, Oscoda, and Presque Isle. In his report for 1874 the Railroad Commissioner of Michigan made this striking statement, and the comparison is equally valid now: "In the four southern tiers of counties of this State, embracing 17,894 square miles of territory, and a population, according to the census of 1874, of 997,701, we have 2,333 miles of railroad. This is equal to one mile of road to every 427 inhabitants, while in Massachusetts there is only one mile of road to every 879 inhabitants; and in Connecticut there is but one mile of road to every 620 inhabitants; so that we have within the limits of the territory mentioned, in proportion to the population, more than two miles of road to one in Massachusetts, and one and two-fifths miles of road to one for Connecticut."

THE RAILWAY SYSTEM OF THE UPPER PENINSULA.

The railroads of the upper peninsula are far less numerous in proportion to the extent of territory than those of the lower, but two first-class railroad outlets now connect that northern region with the rest of the world.

THE CHICAGO AND NORTHWESTERN LINE.

The oldest of these is the Chicago and Northwestern, which extends from Negaunee to Chicago, and connects the Lake Superior district first with the great railway system west of Lake Michigan, and then with that of the continent. From Negaunee in Marquette county the course of the Northwestern is southerly to Escanaba on Little Bay de Noquet, thence westerly and southerly through Menominee county to the mouth of the river of that name; there it leaves the State. This road also has numerous branches, principally to the iron mines in its vicinity. The chief of these

is one leaving its main line near the centre of Menominee county and taking a northwesterly course to its present terminus at Florence in Wisconsin, on the boundary of Marquette county, a distance of about 40 miles. This feeder reaches the new and rich iron mines of the Menominee district; it is being extended beyond Florence, and a loop branch is also under construction into the northern part of Menominee county, which will open what is known as the Felch mountain iron district. The total length of this road and its branches in Michigan is about 202 miles.

THE DETROIT, MACKINAC AND MARQUETTE LINE.

The Detroit, Mackinac and Marquette railroad extends from Marquette eastward across the county of Schoolcraft through a portion of Chippewa near its southern border, and thence across Mackinac to the Straits of Mackinac, where it connects with the lower peninsula system. It has been completed during the present autumn (1881), and furnishes the only line of railway communicating between the two peninsulas. Its plan also includes a branch from a point on its main line northwest of the Straits of Mackinac eastward to Sault Ste. Marie. There it will within a few years connect with the Canadian railways which are being pushed into the northwest. It will then become an important link between the Northern Pacific and the Canadian systems, and form part of a continental line which will shorten by over two hundred miles the distance by railroad between the producers south and west of Lake Superior and the ocean ports of Montreal and New York. At present this road will command a large local traffic, the terminal points of what is now its main line, Marquette and St. Ignace, being ports advantageously situated for connection with the lake lines of transportation. The length of the completed portion of the Detroit, Marquette and Mackinac is 152 miles.

THE MARQUETTE, HOUGHTON AND ONTONAGON LINE.

This road extends from Marquette to L'Anse at the head of Keweenaw bay, passing through the productive iron mining districts of Marquette and Baraga counties and having numerous branches leading directly to the mines. Its total length with that of its tributaries is over 90 miles. An extension to Ontonagon was part of the original project, and there is a vigorous movement on foot to secure its early construction. Ultimately, this line also will connect with the eastern terminus of the Northern Pacific, forming the link between it and the Detroit, Marquette and Mackinac, and thus becoming a part of the great trans-continental thoroughfare already described.

THE NARROW GAUGE ROADS OF THE UPPER PENINSULA.

The Portage Lake copper district has two lines of narrow gauge railroad, whose existence is chiefly due to the needs and enterprise of the Calumet and Hecla mine. The Mineral Range road (three feet gauge) extends from Calumet to Hancock, both in Houghton county, a distance of 12 miles. The Hecla and Torch Lake railroad, with a gauge of four feet one inch, and four miles in length, connects the Calumet and Hecla mine with Lake Linden on the banks of Torch Lake.

PROJECTED ROADS.

The map accompanying this pamphlet has been prepared with much care from the best accessible authorities, and has been subjected to a painstaking revision. It is believed it will be found to be accurate in all essentials. In its preparation the effort was made to include all projected railroads, whether new lines or extensions of those already in operation, whose construction was either actually commenced or seemed to be reasonably probable in the immediate future. In some instances there were no surveyed lines to be followed and in others a departure from the route originally marked

out seemed probable, and then only the general direction of the new road could be given. This was true of the proposed Alpena and Bay City road along the Lake Huron shore. It was also true of all the projected railroads of the upper peninsula. Only the general course of the Sault Ste. Marie branch of the Detroit, Mackinac and Marquette is indicated. The Ontonagon extension of the Marquette, Houghton and Ontonagon follows on the map the direct line from L'Anse across the base of the Keweenaw peninsula, but it is possible that work may be commenced at some point southeast of L'Anse and pushed on in a westerly direction, Ontonagon being reached by a connection with the new Ontonagon and Brulé River line. The rule of giving the general direction merely has been followed in laying down the routes of projected railroads of which no part is yet in operation.

The chief of these in immediate importance is the Ontonagon and Brulé River, already ironed from Ontonagon to Rockland, a distance of about twelve miles. This extends from Ontonagon in a southeasterly direction, crossing a corner of Houghton and the western end of Marquette county to the Brulé river, where it will be ultimately met by a Wisconsin road, giving it valuable southern connections.

Another project of very great importance is the extension of the Northern Pacific from the western boundary of the State across the counties of Ontonagon and Marquette to a connection with the roads already built which lead eastward to Marquette and the Straits of Mackinac, and will soon reach Sault Ste. Marie. The Northern Pacific proper, as originally chartered by the general government, terminates at the boundary line between Michigan and Wisconsin. An extension eastward from Duluth, its present terminus, to that boundary is now in progress, and its advance across the upper peninsula to eastern connections cannot be long delayed. Since the engraving of the map was completed articles of association have been filed at Lansing (on Oct. 12, 1881) by a company of Massachusetts capitalists incorporating "the St. Mary's and Minneapolis Railroad," with a capital stock of $10,000,000, for the purpose of constructing a road from Minneapolis through the entire length of the upper peninsula. For this work the sum of $500 per mile has been already subscribed, and five per cent of this amount has been paid in.

The State has made a liberal grant of lands to secure the construction of a railroad from L'Anse to Houghton. This will give the rich copper mines of Keweenaw point permanent rail communication with all parts of the country, and thus will be of the utmost importance to that region. Men of enterprise and means have already taken hold of this project, and the preliminary surveys were commenced but not completed during the summer of 1881.

No county of the upper peninsula except Keweenaw is now without its railroad line, either in actual operation or in a reasonably advanced stage of construction.

GENERAL FEATURES OF THE MICHIGAN RAILWAY SYSTEM.

The description given of the railroads of Michigan in the preceding pages will enable the inquirer to trace the course of any line upon the map, to ascertain the parts of the State which it supplies with railroad facilities, and to form some estimate of its value as a means of transportation. This table gives the total mileage of Michigan railroads in 1881, and also the freight rates of 1879 as given in the last published reports of the Railroad Commissioner of the State:

Statistics of the Railroad System of Michigan.

ROADS AND THEIR BRANCHES.	Length (1881) Miles.	FREIGHT (1879) RATE PER TON PER MILE.		
		Through.	Local.	Average.
Lake Shore and Michigan Southern	531	$0.00.52	$0.00.70	$0.00.64
Michigan Central	903	00.49	01.35	00.69
Grand Trunk Chicago and Grand Trunk	320	00.44	01.34	*00.48
Wabash, St. Louis, and Pacific	80	.....	.....	†.....
Detroit, Lansing, and Northern	258	.....	.....	01.94
Chicago, Saginaw, and Canada	38	.....	.....	03.3
Detroit, Grand Haven, and Milwaukee	189	00.43	02.2	01.33
Flint and Pere Marquette F. & P. M—Saginaw & Mt. Pleasant branch	315 15	00.47	01.73	01.55 ‡.....
Grand Rapids and Indiana	318	01.29	02.5	01.5
Chicago and West Michigan	354	.....	.....	01.8
Canada Southern	65	.....	.....	00.64
Fort Wayne and Jackson	46	.....	.....	01.32
Toledo, Ann Arbor, and Grand Trunk	57	.....	.....	03.1
Lake George and Muskegon	10	.....	.....	04.4
Pinconning	20	.....	.....	01.72
Tawas and Bay County	24	.....	.....	†.....
St. Joseph Valley	10	.....	.....	†.....
Port Huron and Northwestern	100	.....	.....	05.14
Paw Paw Toledo and South Haven	13	.....	.....	16.5
Muskegon River and Rose Lake	8	.....	.....	02.38
Hobart and Manistee	10	.....	.....	02.5
Upper Peninsula.				
Chicago and Northwestern	202	.....	.....	01.5
Detroit, Mackinac and Marquette	152	.....	.....	†.....
Marquette, Houghton, and Ontonagon	90	07.02	03.18	03.32
Mineral Range	12	.....	.....	05.29
Hecla and Torch Lake	4	.....	.....	03.4
Total	4,144	.....	.....	$0.00.92

*Rates for the Grand Trunk only. †Not in operation in 1879. ‡Included in F. & P. M. total.

The Michigan Central, Detroit and Milwaukee, and Lake Shore roads possess special charters, containing advantageous features. The policy of granting such charters was long since abandoned by the State and is now forbidden in its constitution. All other roads than those named are organized under a general law. The rapid development of the railway system of Michigan has been due to government and municipal aid as well as to natural causes. The State itself built part of the older roads, soon selling them to private corporations. The United States and the State have made liberal grants of land to encourage the construction of lines in the northern counties, thus making it possible to build them in advance of settlement and business, and to make them lead in and not wait for the development of the country. The amount of the grants of land made by congress to Michigan in aid of railroads is nearly 5,000,000 acres and over 3,000,000 acres have been earned by the construction of such roads. At one time also considerable aid was given to railroad enterprises by municipalities, but this policy was decided by the courts to be without constitutional warrant. These causes, added to the remarkable agricultural and industrial growth of

Michigan, have both given to its settled counties railway facilities fully equal to those of older States, and have made well equipped lines of road penetrate the northern forests, placing the pioneers of the new counties on an equality in this respect with their southern brothers.

The State has also made large grants of land for the construction of wagon roads in its northern portions. Some of these appropriations have not yielded adequate returns, but fortunately this is not true of many of them. The State wagon roads which have been honestly constructed under this policy, open up to travel many districts not reached by railroads, and thus materially promote their settlement.

FARE FOR PASSENGERS.

The cost of travel, first-class, on the Michigan railroads is generally about three cents a mile for a single trip, with a slight reduction on round-trip tickets. On some of the roads commutation tickets between prominent points on the line, and 1,000-mile tickets, are sold at a considerable abatement from the regular tariff—a matter of convenience to those whose business compels them to travel. The trunk lines having direct connection with the ocean ports furnish second-class cars and sell tickets for passage thereon at cheaper rates, but as a rule first-class tickets only are sold in this State. All cars are warmed in winter, provided with water, and otherwise made comfortable for travelers.

THE STATE AND THE RAILROADS.

The State does not assume to control the business of the railroads, but does enforce upon them the observance of certain regulations which it regards as essential to the public safety. A Commissioner of Railroads appointed by the Governor acts as the agent in this respect between these corporations and the people, and to him the railroad companies are required to periodically make detailed reports of their operations and condition. The last published report of this officer showed that the cost of the railroads of Michigan up to 1879 had been $154,426,729; their present cost (October, 1881) is in excess of $180,000,000.

WATERWAYS TO THE SEABOARD.

The interior river system of Michigan contains only a small amount of navigable water. Lake vessels can ascend the Saginaw for a score of miles, and the tortuous channel of Portage river in the upper peninsula has been so deepened and straitened that the largest class of steamers can enter Portage Lake. The Grand, the Kalamazoo, the St. Joseph, the Clinton and a few others will float vessels of light draft for short distances, but now possess only a very limited usefulness for transportation purposes. On the other hand the rivers which form part of the eastern boundary of Michigan—the St. Mary's, the St. Clair, and the Detroit—are in fact straits connecting great seas, and far superior in commercial importance to the Bosphorus and the Dardanelles. During each season they bear upon their surface thousands of vessels with cargoes valued at many millions.

Michigan has no interior canals in its lower peninsula. In Macomb county there is a short work of this kind, which is now used only for its water power, and is all that represents a project of the early days of the State for connecting the Clinton and the Kalamazoo rivers and thus uniting the waters of Lakes Michigan and St. Clair. The upper peninsula has an important ship canal connecting the upper extremity of Portage Lake with the western shore of Keweenaw Point; it was built, with the aid of a government grant of lands, by a private corporation which still owns and

controls it, collecting tolls at a low rate for its use. By it vessels avoid a detour of 120 miles around the peninsula which it, with Portage lake and river, completely divides. Two first-class ship canals, situated on waters which form part of the State's boundary line, facilitate the navigation of the great lakes. They are located at the head of the St. Mary's river in the upper peninsula, and at the mouth of the St. Clair river in Lake St. Clair. Both are the property of the general government, and their use is not subject to tolls or charges of any kind.

THE NAVIGATION OF THE GREAT LAKES.

These improvements have, for the purposes of commerce, brought to a common level the waters of Lakes Superior, Huron, Michigan, and Erie. Vessels of a capacity of over 2,000 tons and drawing sixteen feet of water can now sail from Duluth or Chicago direct to Buffalo or the entrance of the Welland canal at Port Colborne. The most serious obstacle in their path is a ledge of limestone crossing the Detroit river near its mouth and locally known as "the Limekilns," which is troublesome to heavily laden vessels in certain conditions of the wind; the United States is now at work deepening the channel at this point so that boats drawing even eighteen feet of water may have a safe passage. The coast line of Michigan is entirely upon these great lakes, and all of its ports possess the commercial advantages attendant upon such a situation. Detroit, which has in its superb river a harbor of practically unlimited capacity, is especially fortunate in this respect. Michigan is divided into four customs districts with headquarters at Detroit, Port Huron, Grand Haven, and Marquette. Deputy collectors are appointed for every point possessing reasonable shipping facilities along the shores, such points thus becoming practically ports of entry and clearance. The government of the United States has also expended several millions of dollars for the improvement of the harbors of both peninsulas, and still annually makes liberal appropriations for this purpose.

THE CANALS BEYOND LAKE ERIE.

On reaching the foot of Lake Erie western produce shipped by water can reach the seaboard by one of two canal systems: 1. It can undergo re-shipment at Buffalo, and pass through the 350 miles of the Erie canal to the Hudson and New York in boats not drawing over seven feet of water, paying tolls to the State of New York and charges for handling at Buffalo; 2. It can pass through the 27 miles of the Welland canal, cross Lake Ontario, and reach tidewater on the St. Lawrence *via* the forty miles of the Lachine, Beauharnois, Cornwall, and Williamsburg canals, which flank the St. Lawrence rapids. These Canadian canals will now pass vessels drawing nine feet of water, and the Dominion government is vigorously at work enlarging the capacity of this entire system. The Lachine will at this time admit vessels drawing twelve feet of water, and a similar enlargement of the Cornwall is well advanced. The improvement, now nearly completed, of the Welland canal has been of the most thorough and important character. By costly excavating, its upper level has been brought down to the level of Lake Erie, and it thus has an inexhaustible feeder for its entire length in that vast reservoir, and is no longer dependent upon small inland streams for the supply of water for its highest stretches. For twelve miles a new canal has been built, containing twenty-four locks of massive masonry and provided with numerous reserve basins which practically form a second and larger canal for a space of several miles. The cost of these improvements to the Canadian government has not been less than $20,000,000, and the result is the deepening of the Welland to twelve feet in the locks for part of its length and to fourteen feet for part. This great work will not be fully completed until a new aqueduct is finished at Welland, and the enlarged canal has not yet been thrown open to the public.

PROPOSED IMPROVEMENTS AND THEIR EFFECT.

Even with the present capacity of the St. Lawrence canals shipments of breadstuffs from the upper lakes to British ports have been made repeatedly and successfully, and it is the belief of many shippers that the establishment of a regular direct trade between the great lakes and Europe will become feasible when the projected enlargement of the entire system shall have been carried out, so that vessels drawing twelve feet of water can reach the lower St Lawrence. Meanwhile the Welland enlargement, even in its incomplete stages, has led to the agitation of schemes for the deepening and widening of the Erie canal, and has stimulated a competition between the Canadian and New York systems which has led to great reductions in tolls; for instance, the Erie tolls, which were six cents on a bushel of wheat before 1870, now amount to only one cent per bushel. That the discussion of these projects will be followed by practical results in the form of more capacious and cheaper means of transportation beyond Lake Erie is inevitable, and every step in that direction will help Michigan commerce and bring the producers of this State nearer to eastern and foreign consumers of their surplus crops. Even under the present conditions, when the largest classes of lake vessels cannot pass the barrier of Niagara Falls, the waterways of the great lakes and of the eastern canals are of inestimable value to the farmers of Michigan and of the whole northwest in furnishing them with a transportation that is cheap in itself and is also of vast additional importance as a check upon railroad freight tariffs. Given improved conditions in the form of an enlarged Erie or of a Canadian canal system that will pass vessels of twelve feet draft to the Atlantic, and the advantage of Michigan in natural location will make itself still more signally manifest.

PRACTICAL ASPECTS OF THE TRANSPORTATION QUESTION.

Reserving the peculiar features of the commerce of the upper peninsula for special consideration under another head, the practical aspects of the transportation question with reference to the State at large may be summed up as follows. The great advantages possessed by the people of Michigan in the variety and the cheapness of the means of transportation between their farms, manufactories, and mines, and the great body of consumers outside the State, are these:

1. Almost the entire State has short rail communication with the lake ports, and thus can secure water transportation at cheap rates to the west, the east, and especially to the seaboard, for its grain, lumber, iron, salt, fruit, and other products.

2. It is traversed by railroads intimately connected with all of the great east and west trunk lines, and the lowest rail rates to the west, the east, the southeast and the Atlantic coast can thus be obtained at all times by its shippers.

3. Its railroad lines are interwoven with each other to an unusual degree, and every important junction or point of contact enjoys the advantage of competition, and gets the benefit of low through rates. For some years the average charge for carrying freight of all the roads doing business in Michigan has been so low as to make them vigorous competitors during the season of navigation with the lake lines. The table on page 106 shows that this rate was in 1879 less than one cent per ton per mile, and this average was not exceeded in either 1880 or 1881.

4. The points in Michigan at which rival railroads come in contact are so numerous, and their lines cross each other so frequently, that no combinations of the great trunk companies, and no pooling of interests on their part, can prevent local competi-

tion from making itself felt. The experience of the past fully sustains this statement and the shipping points of Michigan have not been without the benefits of competition even at times when the railroads were in theory acting in entire harmony.

5. Michigan is several hundred miles nearer the seaboard than either Iowa, Nebraska, Kansas, Minnesota, or Dakota, and practically than Wisconsin, the other grain-producing States and territories of the northwest which also have cheap lands for sale in large quantities. The selling prices of all surplus crops in this region are determined by the prevailing rates in the Atlantic cities, which in turn are controlled by the condition of the European markets. Wheat of the same quality will sell in New York for the same price, whether raised in Michigan or farther west, but it can be carried to New York from Michigan at a cheaper rate than from any point beyond the lakes; therefore, the farmer in this State can get for his crop a price as much higher than that which his western competitor can command as the rates of freight are in his favor. This is one of the important causes producing the results exhibited in the comparative tables on pages 34 and 35. As a matter of fact it has during the last few years cost the farmers of the northwest from seven to seventeen cents more per bushel to market their exported wheat than it has those of Michigan, and this difference the producers of this State have realized in the shape of better prices. What is true of wheat, the most valuable staple of this region, is also true of the other surplus products which seek an eastern, southeastern, or foreign market.

6. From nearly all the principal cities of Michigan shipments can be made on the most advantageous terms to the eastern consumers or to Atlantic ports. Many interior towns now compete with Detroit in this respect, and the tendency of railroad management is toward the multiplication of these smaller points of direct through shipment. Such a system helps the producer, who gets in an increased price the benefit of the saving effected by thus avoiding high local freight charges, the expenses of reshipment, and the commissions of middle-men at one point.

7. Within the past season (1881) wheat has been shipped from Detroit to New York, by lake and canal, at a cost of but six cents per bushel excluding insurance. Within the last few years the highest rate known between these points has been about nineteen cents per bushel; a fair average between these two extremes on the entire amount of wheat shipped in all seasons during several years would be from ten to twelve cents per bushel. These low rates enure to the benefit of the farmers of Michigan, who have always obtained fair prices for their crops. They have never found it necessary to imitate the example of their less fortunate brothers on some of the prairies of the far west, who have found it more profitable to use their grain for fuel than to pay the charges for transporting it to a market.

THE UPPER PENINSULA.

The enormous wealth of the upper peninsula in minerals has diverted attention from its agricultural capabilities. During the last few years homesteads have been located in the eastern portion, but most of the lands heretofore bought from government lying in the westerly counties have been selected for mining or lumber purposes. It is becoming every day better known however that the region not long ago deemed so remote, and still associated chiefly with iron and copper, contains resources in the soil of some of its sections not less bountiful than those which are dug from its mines.

AGRICULTURAL DEVELOPMENT.

The winter wheat of Chippewa county, where ten years ago no wheat was raised, received the first premium at the Michigan State Fair of 1881. Soil, climate and experience combine to assure for this cereal a large and successful production in most of the counties of the upper peninsula. The cultivation of oats, barley and buckwheat has been pursued for years in many locations with remunerative results. The field peas which the Lake Superior counties send to market are marvels in productiveness and size. Their potatoes are sought for family use by housekeepers in Detroit and elsewhere who are familiar with their quality, and the crops they yield are enormous. Noxious insects, whose ravages are often so fatal to the hopes of farmers further west, are there entirely unknown. "The chief products of the soil," it was stated in the latest report of the Commissioner of Mineral Statistics concerning a portion of this section, in words that will apply generally, "are grass, hay, oats, potatoes, rutabagas, garden vegetables and small fruits. Owing to the deep snows of winter, stock raising has received but little attention. But that the country is well adapted to the raising of cattle, the writer knows by seeing how rapidly imported animals take on flesh grazing upon the native grasses of the country, which spring up as soon as the forests are cleared, and are fully equal in every respect to the celebrated Kentucky blue grass. This grass remains green, if it does not grow all winter, under the deep snows of that latitude; the ground does not freeze, and as soon as the snow disappears in spring the pasturage is good. Cattle-raising, also sheep-raising, could be made a profitable industry in the mining regions, we have no doubt; the period for foddering cattle, after all, would be no greater than that which rules in the vicinity of the State capital." In some portions of this region apples and plums arrive at great perfection. Thrifty and well-stocked kitchen gardens are numerous in the more populous districts, and the wild berries of the whole country are famous for their abundance, size, and flavor. The mines have for years absorbed the energies and the means of settlers in the upper peninsula, and it is only recently that agriculture has received attention in any part of that region. But a change has now commenced—is, indeed, well advanced—which is destined to assume new and increasing proportions. All the indications are that the gardens of the mining districts and the wheat farms of Chippewa county will soon be spoken of as the pioneer ventures of an important agricultural interest, and the products of the Lake Superior counties will form a considerable item in the "Farm Statistics" of Michigan. The opening of the Detroit, Mackinac and Marquette railroad, passing to a great extent through a country susceptible of valuable agricultural development, will give increased impetus to the growth of that part of the State. The completion of the Ontonagon

and Brulé river line, now in progress of construction, and which will cross the western portion of the peninsula from Ontonagon to its southern boundary, and the extension through the same region of the east and west lines, which cannot be long delayed, will also aid largely in bringing out resources in which those who are most familiar with their possibilities have great faith. The home markets of the upper peninsula will afford for many years a steady demand for the products of its soil. A hardy class of immigrants are already seeking the cheap and promising lands to be found within its territory, and there can be no doubt that within a few years its agricultural productions will bear a much nearer proportion to those of its mines. It is rich, also, in the quality and variety of its hard woods, which in the hands of intelligent settlers, and with an easy accessibility to markets, enter largely into the profits of new farming.

CLIMATE.

The climate of the upper peninsula is of course colder than that of the southern portions of the State. It is also more equable, and the people of that region are hardy, healthy, and long lived. Invalids find vigor in its dry and bracing atmosphere, and it has long enjoyed a reputation as a spot where the debilitated could regain strength from the healing influences of nature. The annual mean temperature at Marquette is about 38°.

WAGON ROADS.

Settlers in the upper peninsula are by no means dependent upon its railroad system for facilities of travel. By the aid of grants of land from the State many wagon roads have been substantially built, which open up large tracts of country and will prove important aids to their development. These roads have been in the main wisely planned, and supply a great expanse of territory with valuable means of communication with railroad stations or settlements on the lake shore.

TRADE AND TRANSPORTATION.

The railroad system of the upper peninsula and the waterways which are open to its commerce have already been fully described. Its carrying trade has been in the past almost wholly confined to the importation of supplies and to the shipment of the bulky metals and ore which are yielded by its mines. Naturally the lakes have furnished the chief channel for this traffic, and the business of the railroads of that country has been largely local in character, and limited to completing the connection between the lake ports and the centers of mining industry. During the winter suspension of navigation the single line of the Chicago and Northwestern has been the only outlet, and it has then enjoyed the benefits of a monopoly of passenger travel and of such freight business as was not transacted during the open season. The completion of the Detroit, Marquette, and Mackinac gives a much more direct means of communication with the continental railway system. This new line will certainly command its share of the local traffic, control the railroad business between the two peninsulas, and prove a vigorous competitor with the Northwestern for through travel and freight. It is thus an important addition to the railroad facilities possessed by the developed districts of the upper peninsula, aside from its value as a means of opening to settlement an entirely new tract of country.

There is no probability of any essential changes in the general character of the commerce of the Lake Superior region in the immediate future. The development of its agricultural capabilities will for some years merely lessen the amount of supplies its mines will import, and its farmers will go no farther than the brisk home market to dispose of their surplus crops. The shipments of its mineral product will continue

to be made chiefly by water, and its railroads will find their main source of income in their passenger and local freight business. But when its development, which is certain to be both rapid and steady, shall have multiplied its population, diversified its industries, and given a more complex character to its commerce, the advantages of its location will become plainer. The great lakes will still be the servants of its merchants and shippers. The railroads that are already in existence will connect it with the great trunk lines of to-day. By that time also it will be traversed from Montreal river to Sault Ste. Marie by a great trans-continental thoroughfare, passing north of Lakes Huron, Erie, and Ontario, and reaching an ocean port at Montreal. It will thus always be within easy reach of the southern, eastern and seaboard markets by rail or vessel, and it can now include this important assurance among the attractions which it holds out to settlers.

UNOCCUPIED LANDS.

There are eight to ten millions of acres of wild lands in Michigan, not included in farms already laid out, which are capable of being made profitable in agriculture. The table which is printed on the face of the map accompanying this pamphlet points out where many of the unoccupied lands may be found.

UNITED STATES LANDS.

There are about 300,000 acres of land yet belonging to the United States in the lower peninsula. Except in a few counties these are generally in small tracts, among which are occasional 80 or 40 acre lots of a desirable character, some of them in the vicinity of valuable State or railroad lands. The greater portion, embracing a considerable diversity of soil, lies in the northeastern counties bordering upon or near Lake Huron, more than half of the whole amount being situated in Presque Isle, Montmorency, Oscoda, and Iosco. In the upper peninsula there are 1,400,000 acres, lying in greater or less proportions in every county. Locations of government lands in that region heretofore have been mainly for mining and lumber, but increase of railroad communication is rapidly drawing attention to its agricultural character.

HOW TO ACQUIRE TITLE.

Title to government lands may be acquired either by settlement under the homestead law or by purchase. Under the former process any person who is a citizen, or has legally declared his intention to become such, may obtain a homestead of 160 acres (or less) of contiguous lands, by filing an application describing the land he has selected, and an affidavit asserting his purpose to be actual settlement and cultivation. The fees required to be paid when this entry is made are $14 for 160 acres; $7 for 80 acres; and $6 for 40 acres. After a residence of five years and reasonable improvements upon the land, and before seven years have expired, he must prove such residence and improvement to the satisfaction of the district land office, paying a further fee of $4 on locations of 160 acres, $2 for 80 acres, and $1 for 40. He will then receive a certificate showing his compliance with the requirements of the law, and without further payments the land will be his own in fee and the government will issue its patent to that effect. Lands entered under the homestead laws of the United States are exempt from taxation by the State during their probationary occupancy. The laws also declare that "no lands acquired under the provisions of this chapter (on homesteads) shall in any event become liable to the satisfaction of any debt contracted prior to the issuing of the patent therefor."

All of the government lands in market in this State are offered to purchasers in sections or fractions of sections at the rate of $1.25 per acre. Any person may become the owner of such lands by making application at the district land offices, describing the tracts desired, and paying therefor at this rate.

UNITED STATES SYSTEM OF SURVEYS.

The system of United States surveys which governs the description of lands in this State and elsewhere, is based on meridian lines running north and south, and base

lines drawn from east to west. The meridian line of Michigan forms the boundary between Hillsdale and Lenawee counties, and extends through the entire length of the State to the St. Mary's river. The base line crosses it at right angles on the north line of Jackson county, running due east and west from Lake Michigan to Lake St. Clair, and forming the northern boundary of the second tier of counties. Townships are numbered in northern and southern directions from the base line. Ranges (as they are called) are numbered in eastern and western directions from the meridian line. The intersection of a given range (east or west) with a given township (north or south) describes a locality. Township No. 4 north of Range No. 2 west, for example, designates the township in which Lansing, the capital of the State, is situated, and means that it is in the fourth tier of townships north of the base line, and in the second range of townships west of the meridian line. Counties laid out on a uniform plan usually contain 16 townships; each township is six miles square, and contains 36 square miles; each square mile is called a section; each section has 640 acres of land, and is divided into sixteen equal parts of 40 acres each, and each subdivision of 40 acres or more is described by its geographical relations to the whole section. Thus, the exact locality of the capitol building is on the west half of section number sixteen, in township number four north, of range number two west; or in the abbreviations usually employed it is the W. ½ of Sec. 16, T. 4 N. of R. 2 W. These descriptions carry a certain and specific meaning, and are used in legal conveyances. Lands which have been private property for many years retain their original designation. The State, the railroad companies, and individual landholders employ the same method of describing lands in their transactions with purchasers.

THE GOVERNMENT LAND OFFICES.

A government office for the sale of United States lands is established in each land district, of which there are four in Michigan. The officers in charge are designated respectively a Register and a Receiver. The limits of each district are closely defined, and the officers in one have no relations to the territory of another.

The Detroit district covers the eastern and earliest settled portions of the State, in which the government lands were long since disposed of, together with the eastern portion of the Huron peninsula, Alpena, Montmorency, Presque Isle, and parts of Otsego and Cheboygan counties. The office is located at the city of Detroit, and on the 1st of October it had on sale about 96,000 acres of land situated in the following counties:

Cheboygan	8,673 acres	Presque Isle	31,563 acres
Otsego	3,874 "	Montmorency	45,907 "
Alpena	6,060 "		

The Saginaw district embraces the territory lying in the lower peninsula east of the meridian line and not included in the Detroit district, with parts of Gratiot, Midland, Gladwin, Roscommon and Crawford. The office is at East Saginaw. The lands remaining unsold in October amounted to about 127,000 acres, and were situated as follows:

Alcona	9,360 acres	Ogemaw	1,560 acres
Crawford	16,260 "	Oscoda	67,150 "
Iosco	28,000 "	Roscommon	4,940 "

The Reed City district includes all the lower peninsula not covered by the Detroit and Saginaw districts, dividing Cheboygan and Otsego with the former and Crawford and Roscommon with the latter. It has its office at Reed City, in Osceola county, and holds about 78,000 acres of land in the counties named below:

Antrim	571 acres	Manistee	14,888 acres
Benzie	3,750 "	Manitou	15,393 "
Charlevoix	154 "	Mason	4,767 "
Cheboygan	2,075 "	Missaukee	2,833 "
Clare	2,075 "	Montcalm	40 "
Crawford	6,197 "	Muskegon	1,166 "
Emmet	2,344 "	Newaygo	888 "
Grand Traverse	1,893 "	Oceana	1,111 "
Gratiot	120 "	Osceola	160 "
Isabella	40 "	Ottawa	80 "
Kalkaska	4,100 "	Otsego	200 "
Lake	3,120 "	Roscommon	6,513 "
Leelanaw	2,935 "	Wexford	1,006 "

The Marquette district covers the upper peninsula. The office is at Marquette, and nearly five-sixths of all the lands belonging to the United States government which lie in the State of Michigan are at its disposal, and number about 1,400,000 acres. These lands are distributed among the following counties:

Baraga	62,000 acres	Mackinac	78,000 acres
Chippewa	292,600 "	Marquette	223,600 "
Delta	135,340 "	Menominee	45,800 "
Houghton	59,000 "	Ontonagon	363,000 "
Isle Royal	14,640 "	Schoolcraft	137,500 "
Keweenaw	4,000 "		

EXPERIENCE NEEDED IN SELECTING LANDS.

It is not wise for inexperienced persons to undertake the selection of wild lands without the aid of practiced examiners. The United States district officers have no other information in regard to specified tracts than is contained in the surveyor's notes, and these are not sufficiently precise to lead to an intelligent judgment. Settlers will always be able to acquire a general knowledge of the local characteristics of a neighborhood through reliable people in the vicinity, and for a moderate fee may procure the services of an experienced surveyor or agent. But the ultimate choice should depend upon a careful consideration of the questions which a man must determine for himself, and which involve all the points of soil, timber, exposure, drainage, schools, churches, accessibility to markets, and future growth.

Letters addressed "Register and Receiver U. S. Land Office," at either of the places mentioned above as the location of a Government Land Office, will reach their destination.

LANDS BELONGING TO THE STATE.

The lands offered for sale by the State are of three classes, and are known respectively as Swamp Lands, School Lands, and College Lands.

SWAMP LANDS.

The lands which are thus described came into possession of the State under a general law of Congress passed in 1850, which ceded to each State "the swamps and overflowed lands" remaining unsold therein, and known and described as such on the public surveys, for purposes of drainage and reclamation. Under this act Michigan received 5,891,598 acres. It has been found on actual examination that many of these lands are not swamp, but are composed of some of the best soils known to Michigan,

bear some of the finest timber, are level or rolling in character, and are easily converted into rich and productive farms. The presence of overflowed or swampy ground on some portions of a section undoubtedly caused many such tracts to be characterized as wet lands in the surveyor's notes, while most of its legal subdivisions were not only dry but were particularly valuable for purposes of agriculture. It is known that some of them have proved to be among the best farming and timbered lands in the State, Liberal use has been made of these lands in opening up large sections of country by the construction of wagon-roads, paid for in special grants, and directly subsidiary to the purposes of the original cession by the drainage which resulted not only from the building of the roads but from the consequent settlement and cultivation.

These so-called Swamp Lands are offered generally for $1.25 per acre. In a few townships in the northern part of the State they are held at $2 per acre. One hundred and sixty acres or less lying in one body can be bought on payment of a quarter of the price at the time of purchase, by any person who will make affidavit that he will settle on the land within one year, and that it is not valuable mainly for the pine, cedar or hemlock timber growing thereon. Ten years' time, with interest at seven per cent annually, is allowed on the remainder of the purchase money.

These lands are also subject to homestead entry in lots of 80 acres or less upon certain conditions. The application must show that the applicant—man or woman—is 21 years of age or upwards, and is not the owner of forty acres of land anywhere in the United States; that he or she intends to settle upon, occupy, cultivate, and improve the land described in the application, and has never taken a State homestead before. A fee of $2 must accompany the application which will be returned if a license to locate is not granted. If the land is found to be vacant, and the required qualifications are satisfactory, the applicant receives a license, under the terms of which he or she must immediately settle upon, and continue for five years to reside upon, occupy and improve the land. Within three months proof of settlement and the beginning of improvements must be filed with the Commissioner of the Land Office. After five years of residence the settler may obtain a patent from the State without additional charge. Any person having a State homestead may purchase adjoining swamp lands on the terms given above, but his total number of acres, including the homestead, cannot exceed 160.

Upwards of 300,000 acres of the Swamp Lands ceded to the State remain undisposed of.

SCHOOL LANDS.

Those who have read the account given in preceding pages of the generous endowment of lands made by Congress for primary school purposes will readily understand the meaning of this term. The State has yet in its possession upwards of 400,000 acres. They are held at $4 per acre. In cases where these lands are valuable for pine, cedar or hemlock timber, they must be paid for in cash at the time of purchase; where they are valuable mainly for farming purposes time is given on half their cost. Persons who desire to buy partly on credit must accompany their application with an affidavit, duly verified and endorsed, giving a description of the land selected, and the kinds and estimated quantities of the timber growing thereon, and the Commissioner will then decide whether it is of the class upon which credit can be given. Blank forms of affidavits will be furnished by the State Land Office. After the first payment has been made on what are held to be strictly farming lands, and which must be at least one-half their value, unlimited time will be allowed on the remainder, which will bear interest at seven per cent, and may remain unpaid at the option of the purchaser as long as the interest is promptly met.

There are many good lands to be had under this description in the northern counties of the State. The table printed below will indicate their locality. Some counties contain extensive areas lying in contiguous tracts.

COLLEGE LANDS.

These lands are a grant from the United States for the benefit of the Agricultural College. They are all in the lower peninsula, and in its northern counties. The law under which they were ceded admitted of a choice from "the public lands subject to sale at private entry at $1.25 per acre," excluding mineral lands, and they were carefully selected by experienced land examiners after personal inspection with reference especially to their agricultural qualities. Similar conditions attend their sale as those which exist in regard to the School Lands, but they are held at a higher price. Where their timber resources are a primary consideration, the price at $5 per acre must be paid at the time of purchase; when valuable principally for farming purposes the same price is demanded, but three-quarters of the purchase money may remain on interest at seven per cent for an unlimited period. There were nearly 150,000 acres remaining unsold on the first of October, 1881.

THE STATE LAND OFFICE.

The State Land Office, at Lansing, under the charge of a Commissioner, has the management of all public interests pertaining to the State lands. It employs no local agents, and business with it may be transacted by correspondence. It advertises in its official circulars that the office "cannot give information about the soil and timber of any particular lot, but buyers and settlers are advised to examine for themselves before taking." It will furnish plats, however, to aid in looking up State lands, at established rates, viz.: plats showing vacant lands, 25 cents per township; same with streams drawn, 50 cents per township; same showing vacant lands, streams, and names of purchasers of State lands, $1.50 per township. Plats showing all the vacant State lands in any county will be furnished at prices ranging from 25 cents to $4, according to the amount involved. The United States system of surveys, heretofore explained, regulates the usages of the Land Office, and in ordering plats of townships it is necessary to give number and range.

The Land Office will also furnish all needed instructions as to forms of procedure in acquiring title to State lands, together with blanks for the affidavits which are required. Money may be forwarded by post-office orders, registered letters, National bank drafts on New York or Detroit, or by prepaid express. Personal checks are not credited until collected. Post-office orders and bank drafts should be made payable to "Commissioner of the State Land Office," and correspondence should be addressed to that officer, at Lansing, Michigan.

State Lands Subject to Entry October 1, 1881—Description and Acres.

COUNTIES.	Swamp.	School.	College.	COUNTIES.	Swamp.	School.	College.
Alcona	14,095	5,923	25,785	Lapeer	178	360	.....
Allegan	340	2,769	.....	Leelanaw	1,638	1,855	.....
Alpena	45,960	6,480	840	Livingston	200	40	.....
Antrim	1,058	5,161	6,148	Mackinac	120	34,423	.....
Baraga	.....	11,774	.....	Manistee	2,726	3,283	8,080
Barry	40	111	.....	Manitou	2,002	1,923	.....
Bay	1,118	2,183	.....	Marquette	200	42,405	.....
Benzie	3,923	2,720	.....	Mason	1,052	1,828	.....
Berrien	.....	40	.....	Mecosta	80	1,083	.....
Branch	.....	46	.....	Menominee	3,177	13,814	.....
Calhoun	160	120	.....	Midland	403	3,686	.....
Charlevoix	1,612	2,475	3,405	Missaukee	11,142	3,547	1,759
Cheboygan	20,749	10,697	5,728	Monroe	.....	140	.....
Chippewa	57	34,098	.....	Montcalm	40	200	.....
Clare	1,779	3,744	.....	Montmorency	26,796	6,600	9,118
Clinton	.....	125	.....	Muskegon	.....	4,128	.....
Crawford	13,187	5,594	.....	Newaygo	148	4,474	.....
Delta	271	15,508	.....	Oakland	80	40	.....
Eaton	219	40	.....	Oceana	40	1,200	.....
Emmet	6,086	6,089	.....	Ogemaw	3,818	4,602	.....
Genesee	40	.....	.....	Ontonagon	9,658	35,230	.....
Gladwin	4,517	1,652	.....	Osceola	458	2,012	.....
Grand Traverse	2,973	2,125	720	Oscoda	2,544	5,800	17,065
Gratiot	400	1,120	.....	Otsego	9,686	5,121	4,080
Houghton	.....	13,543	.....	Ottawa	.....	1,213	.....
Huron	.....	3,177	.....	Presque Isle	55,574	10,955	1,239
Ingham	560	40	.....	Roscommon	24,730	4,194	.....
Ionia	80	.....	.....	Saginaw	1,994	2,074	.....
Iosco	17,209	6,291	27,115	Sanilac	123	2,720	.....
Isabella	40	720	.....	Schoolcraft	75	38,191	.....
Isle Royal	3,787	3,876	.....	St. Clair	1,976	440	.....
Jackson	80	400	.....	St. Joseph	.....	80	.....
Kalamazoo	40	.....	.....	Tuscola	565	2,355	.....
Kalkaska	4,583	5,006	1,718	Van Buren	40	320	.....
Keweenaw	.....	2,211	.....	Wexford	1,197	4,280	28,040
Lake	1,348	4,485	.....				

[In this table fractions of acres are omitted. There are besides those enumerated 200 acres of "University land" in Kalamazoo, 30 in Berrien, and 67 in Ottawa; and 280 acres of "asset land" in Lapeer, and 40 in Genesee.]

RAILROAD AND CANAL LANDS.

Various grants of land have been made from time to time by the general government providing for the construction of railroads through new portions of the State. The State has also made grants of its own which have been used for similar purposes. The amount of land acquired through these grants by various railroad and canal companies, and yet remaining in their possession, is about four millions of acres, some portions of it having only a contingent value, depending upon the discovery of mineral resources. The chief value of those which are indicated in the tables below and in the table preceding these pages, lies in their timber and agricultural capabilities.

The grants made by the general government were of alternate sections lying within six miles of the lines of railroad they were intended to advance, and it was provided that in cases where such sections had been already disposed of, indemnity lands might

be appropriated within a range of fifteen miles of the track. Supplementary legislation extended this right in one or two exceptional instances to a distance of twenty miles, but it is evident that lands of this character are none of them very remote from railroads, while the greater portion lie in convenient proximity. They are not all good lands, but some of the best the State affords can be found among them, and their soil, timber, and location present a wide range of selection. Three companies own all the railroad lands in the lower peninsula, and the principal grants under which they derive their titles were made by congress in 1856, when large sections of the country which their lines traverse were parts of an almost unbroken wilderness. One of these is

THE FLINT AND PERE MARQUETTE.

Its line extends from Monroe in the southeastern corner of the State to Ludington on Lake Michigan, and the lands which it holds lie in every county through which its track passes between the head of Saginaw Bay and its western terminus, and in some of the adjoining counties. The company holds its strictly farming lands—or lands which are not valued principally for their pine—at from five to ten dollars per acre. William L. Webber, East Saginaw, is its land commissioner. The number of acres yet remaining in its possession is about 146,000, which are divided among the counties named nearly as follows:

Saginaw	3,000 acres	Mecosta	9,000 acres
Gratiot	1,600 "	Osceola	8,000 "
Midland	11,000 "	Newaygo	13,000 "
Gladwin	1,200 "	Lake	40,000 "
Isabella	5,000 "	Oceana	6,000 "
Clare	3,200 "	Mason	45,000 "

GRAND RAPIDS AND INDIANA.

This line extends from Fort Wayne in Indiana to Traverse City and Petoskey on Grand and Little Traverse bays. Its lands are situated principally in the counties intersected by its rails between the northern limits of Kent and the southern boundary of Emmet, near the Straits of Mackinac. The land commissioner is W. O. Hughart, at Grand Rapids. The company numbers its farming lands at about 570,000 acres, upon which prices range from $3.50 to $7.50 per acre. The figures below represent the quantity held in each county lying within the limits of the grant:

Allegan	445 acres	Montcalm	1.440 acres
Antrim	92,167 "	Mecosta	10,235 "
Charlevoix	55,927 "	Missaukee	55,123 "
Clare	840 "	Manistee	4,189 "
Grand Traverse	56,196 "	Newaygo	9,837 "
Kent	387 "	Osceola	59.114 "
Kalkaska	75,988 "	Otsego	3,764 "
Lake	46,200 "	Wexford	98,185 "

JACKSON, LANSING AND SAGINAW.

The Jackson, Lansing and Saginaw company has for all practical purposes become merged in the Michigan Central. Its line begins at Jackson, on the latter road, and deflecting to Saginaw bay, reaches the extreme northern limits of the lower peninsula at Cheboygan and Mackinac. The land business of the corporation is managed by O. M. Barnes, land commissioner, at Lansing, and prices, as advertised in its publications, "vary from two dollars per acre upwards." It owns lands in all the counties penetrated by the line between the Saginaw bay and the Straits of Mackinac, and in some contiguous counties, numbering in the aggregate about 384,000 acres, distributed as follows:

Antrim	14,040 acres	Montmorency	445 acres
Bay	3,608 "	Roscommon	47,500 "
Charlevoix	8,440 "	Ogemaw	20,323 "
Cheboygan	66,080 "	Oscoda	1,947 "
Crawford	117,482 "	Otsego	89,560 "
Gratiot	780 "	Saginaw	1,720 "
Kalkaska	9,640 "	Other counties	1,520 "
Missaukee	1,320 "		

DETROIT, MACKINAC AND MARQUETTE.

This line, now just opening on the upper peninsula, forms a connection with the road last mentioned by means of a ferriage at Mackinac, and unites Point St. Ignace on Lake Huron with Marquette on Lake Superior and the Marquette, Houghton and Ontonagon railroad, extending westward. Its construction was promoted by a grant from the State, and it owns about 1,326,000 acres of land in the counties which it intersects. W. O. Strong, Detroit, is the land commissioner of the company, whose prices range from four to twelve dollars per acre. The grant is contained in four counties, viz.:

Chippewa	431,887 acres	Marquette	240,217 acres
Mackinac	275,666 "	Schoolcraft	379,193 "

CHICAGO AND NORTHWESTERN.

The Chicago and Northwestern railway corporation, the main lines of which extend in other directions, has a branch which enters Michigan at Menominee and reaches by way of Escanaba to Negaunee, near Marquette, and a smaller one diverging westward into the Menominee iron district. Part of its lands were received from the general government and part from the State. The entire amount owned in Michigan is about 657,000 acres, with prices ranging on those not held chiefly for timber from $2 to $10 per acre. F. H. Van Cleve, Escanaba, has charge of sales. The acreage is divided as follows:

Menominee	176,200 acres	Marquette	188,500 acres
Delta	200,520 "	Schoolcraft	92,000 "

LAKE SUPERIOR SHIP CANAL RAILWAY AND IRON CO.

The lands of this company were acquired under grants to aid in the construction of the Portage Lake canal. They were selected chiefly for mineral and pine, but the agent of the company at Marquette estimates that 60,000 acres in Houghton and 150,000 acres in Ontonagon are suitable for agriculture. All mineral rights are reserved in their sale, and prices are from $2 to $5 per acre. J. M. Longyear, Marquette, is the agent.

ST. MARY'S CANAL MINERAL LAND CO.

This company is the owner of the remaining lands lying in the upper peninsula which belonged to the grant made by the general government in 1852 for the construction of the ship canal around the falls of St. Marys. It estimates its agricultural tracts at 37,000 acres, and the prices placed thereon range from $2.50 to $10 per acre. R. R. Goodell, at Houghton, acts as agent for the company. The lands lie in the following counties:

Houghton	10,000 acres	Ontonagon	20,000 acres
Keweenaw	5,000 "	Baraga	2,000 "

The company has in addition 90,000 acres lying on the copper range, which is for sale without reservation, at prices not yet fixed.

THE MICHIGAN LAND AND IRON CO.—(LIMITED).

Lands formerly in the possession of the Marquette, Houghton and Ontonagon railroad corporation under a government grant are represented by this company. Parties interested think that of 400,000 acres thus represented not to exceed one-quarter are adapted to farming purposes, and these lie in nearly equal proportions in the counties of Marquette and Baraga. They are held at from $2 to $8 per acre. B. J. Stevens, Madison, Wisconsin, will furnish information concerning these lands.

IN THE HANDS OF PRIVATE OWNERS.

It is estimated by intelligent men who have made real estate operations a business that there are in the newer counties of this State, in the hands of private individuals, from one to two millions of acres of wild lands, much of it taken up at government prices, which were selected with especial reference to their agricultural value and are held for an advance on their cost. Generally these are known as beech and maple lands, bearing a large proportion of hard or sugar maple, and they offer an inviting field of selection to those who are looking for an opening to first-class farms. In price they vary from $3 to $10 per acre, depending not only on their quality but on their neighborhood, accessibility to markets, and the relative and prospective growth of the surrounding country.

There are at least as many more acres in the market, and belonging to private parties, that are known as "stump lands." These are lands from which the pine timber has been cut, leaving standing the remaining trees of the native forest, consisting of beech, maple, basswood, elm, hemlock, etc. It has been explained in previous pages of this pamphlet that the best pines grow among hard wood. The soil of a large proportion of these "stump lands" is rich and productive, and in the hands of diligent cultivators will follow its wealth of timber with an equal abundance of good crops. Prices differ, as in other lands, according to location and quality, but selections may be had within a wide range varying from $2 to $8 per acre.

Partly improved farms, the owners of which, in the changing vicissitudes of life, may desire to sell, or which may have fallen into the possession of people living at a distance, can sometimes be bought at very low figures.

It is, of course, impossible to give a definite idea of the selling prices of improved lands in the State at large. The nature and extent of the improvements, the condition of the buildings and fences, the growth of its orchards and the skill and industry with which it has been cultivated, bear relations to the value of a farm quite as specific if not so important as its location and soil. It may be said, however, that farms in the older settled counties of the State, not exceptional in their buildings and in well established neighborhoods, in reasonable proximity to churches, schools, railroad stations and markets, can be purchased at prices varying from $25 to $75 an acre. Farming lands can be bought in even the most populous counties at a lower figure than this minimum, and there are some under high cultivation and having an especial value in their buildings and position which will command considerably more than the amount named in the other direction. But a fair medium in the prices of average farms in the older portion of the State lies between the limits indicated. North of those counties the average is, of course, very considerably lower, although choice and well improved farms in the more advanced localities and in favored neighborhoods will always, as elsewhere, bring prices to correspond with their advantages.

SOME PRACTICAL HINTS.

The peculiar advantages which settlement in Michigan offers to farmers seeking new homes lie mainly in its exceptional adaptation to mixed husbandry, the accessibility of all its parts to general markets, its facilities for transportation, the established character of its institutions and its society, its light public burdens, its certain and rapid growth in the future, and the readiness with which good lands can now be bought for a little money. Nevertheless, to enjoy these advantages some money is necessary. To invest it judiciously is the first consideration, and after all attainable information has been procured the individual judgment must determine the rest.

Persons coming here from other States or countries should, as early as possible, form some idea of the part of the State in which they prefer to settle. It will be comparatively easy after that to acquire definite knowledge of neighborhoods. The county seats and business centers of those parts of the State in which the unoccupied lands are situated always contain competent men who are willing to impart the benefit of their own knowledge to those who are desirous of making a settlement, and the information to be derived from intelligent and trustworthy citizens possessing a local acquaintance with the country is more satisfactory and minute than any that can be obtained from books and advertisements. Then before purchasing there should be a careful and personal examination of the land itself, and of its vicinity and opportunities. The man who buys a farm for the home of himself and his family without exercising his own judgment, will be very apt to fail in any enterprise he may undertake.

There need be no trouble in this State about titles. The greater portion of its soil can be traced directly to the possession of the United States government, through few hands and by a simple transmission. Abstracts of title, certified by the register of deeds of each county, who has the custody of its real estate records, are always to be had at the demand of the purchaser, in transactions with individuals, and county treasurers can furnish histories of the tax records, and where these are satisfactory all the rest is safe. Whether buying of Government, of the State, of railroad companies or of individuals, the careful purchaser will always be sure, however, that his deed contains a correct description of his land.

There are many advantages attending the settlement of new countries in colonies. A company of several families may largely reduce to each member the expenses of choosing a location, outfit, etc., and at the same time preserve the comforts and benefits of old associations. In cases where considerable tracts of land are thus taken up, if purchased from railroad companies or individuals, some modifications may be expected in the price.

After all, ultimate success will depend upon individual traits of character. Without industry, frugality, sobriety, and common sense, there is not much prospect for any one, anywhere, or in any pursuit. It is only claimed for Michigan that these qualities will have fair play here under peculiarly favorable conditions.

EXPERIENCE IN NORTHERN MICHIGAN.

Mr. George E. Steele, now of Traverse City, has resided in the northern counties of this State for twenty years. He is a graduate of the Agricultural College, a surveyor by profession, has been a practical farmer, was formerly a member of the Legislature from Antrim county, and has the confidence of his neighbors. In the discharge of his ordinary avocations he has unusual opportunities of obtaining a personal knowledge of Northern Michigan, and in response to a request to that effect he has furnished for this pamphlet a series of practical suggestions which are here subjoined, and which have a general application.

SUGGESTIONS FOR SETTLERS.

BY GEORGE E. STEELE, TRAVERSE CITY.

The settler in securing a location, if he would be pleasantly situated and not meet with disappointment, must not go at hap-hazard, but must be governed by certain fixed principles, easily understood, and which others, sometimes at a loss, have helped by their experience to fix. Some of these worth heeding may be mentioned.

WHAT SETTLERS SHOULD EXPECT.

I. If you are determined to be a fixture in any part of Michigan, *govern yourself in a measure by the practices and conditions of the particular locality.* This does not mean that a man is not to make his impress on a community he is in; but it does mean that if he goes into Northern Michigan from Southern Illinois, or any far distant point, he is not to expect just what he left, either in habits of society, in practices of agriculture, or products. It would be folly for him to expect to find corn growing sixteen feet high, and because he could not take "two looks and a turn about" over the prairie to declare that Michigan is a fraud; or because tobacco and sweet potatoes are not the principal products of the new country he had set foot in, to say it was useless for men to try farming there. It is not expected that an Iowa man will bring with him a breaking plow eighteen feet long and ten yoke of trained oxen to break up a stumpy farm. And yet there are men coming into Michigan who think they can just drive right through a hard maple stump, not even entrapping their coat-tails. We have seen men, who had lived on prairies, take timbered farms, and with axe in hand go out to work in the morning only thinking how they could "spare that tree." "It is so very high to the top of this timber!" "What a pity this cannot be saved!" "Where we came from they would pick up every chip." There is no doubt that more economy of timber in Michigan would be appreciated by those who come after us, and the wealth of timber here is being more and more valued, but if you stop and show pity you will never have a farm cleared up. The fuller you are of good long days' works and the less you theorize about what people do somewhere else, the sooner your fields will be yielding their increase.

A DIFFERENCE IN MEN.

Men generally seek new homes that they may better their condition, but some are averse to change and are determined to find fault with any country that does not

have just what they are accustomed to. It was only yesterday the writer talked with a gentleman from Cass county in this State, who was looking in Grand Traverse county for a new location. He had been out two days in the roughest part of the county and concluded to go back home on the next train, declaring he had seen all he wanted, and would not take hilly land as a gift.

A case right the opposite is in point: Mr. Adams of Benzonia went there eighteen years ago, selected a high, rough location where a few trees had been chopped, cut a road winding up among the hills, and went to work. The seedling peaches by the stumps near the old log shanty grew rapidly and other fruit was planted. He told us a few days ago that his peach trees had borne sixteen years without a failure, and this year, as poor a year for fruit as it is, he had 200 bushels of peaches, besides a good crop of grapes and pears, and a fair crop of apples, plums, cherries and small fruits. He has not cultivated fruit as thoroughly as it should be, but it seems determined to bear. We measured a peach tree twelve inches in diameter branching into a three-parted head eighteen inches from the ground, each branch a large top in itself. The log buildings have been replaced by a nice frame house and frame barn with basement stable. Board fences have taken the place of brush hedges; the family have taken more lands, and a day of comfort and competence dawns for them. If this man had said "I don't believe fruit will grow here, the soil must be poor," and "I am so far out of the world I can't sell it if I had it," he might still have been in Minnesota—*but not eating his own peaches.*

A NEW COUNTRY REQUIRES NEW METHODS AND NEW IDEAS.

Our first hint will be of practical value from the great diversity of soil, surface, climate, and other conditions found in a State as large as Michigan. There is a decided change from the level plateau of the Saginaw valley to the high lands of Otsego county, with an elevation of 900 feet above the lakes. The Michigan fruit-belt, bordering Lake Michigan and Grand and Little Traverse bays, is known to be very well adapted to fruit culture, and to some extent already has distinctive features. The development of the light sandy lands called "plains," is gradually going on and will require special agriculture, and bring about new processes and products now little thought of. So one must not judge by his home notions.

THE PRODUCTIVENESS OF SANDY AND GRAVELLY SOILS.

The writer was walking along the track of a railroad in northern Michigan, in company with some men who had been in the practice of tilling a stiff soil. They remarked that such heavy sugar maple, elm, and basswood timber generally indicated good soil, but that the sandy and gravelly land was a problem. "See here," said one, "here is a good timothy, three feet tall and not yet in bloom, growing from the very bottom of an excavation." This was the length of a spade handle below the original surface. Farther examination showed that the large embankments taken from deep cuttings were grassed over with rank grass and herbage growing upon them. In each case the place was most unlikely to be so soon growing herd's grass. It is no farther a question whether the sandy lands (and we mean now those lands so very sandy as to raise a suggestion to the owner that he had better strengthen his title to hold them) can be made to produce clover; and if clover, then the other crops adapted to the locality and stock. There are numerous instances, and every year they are increasing, where such fields show for themselves, and show well. The past season the writer saw heavy lodged clover, so rank and thick to mow that it would make one think dinner time never would come, on what was originally light pine lands or "plains" which had been fertilized with stable manure.

EXPERIENCE WITH BURNT LANDS.

Mr. A. T. Case, register of deeds of Benzie Co., about eighteen years ago bought from the Government some burnt lands, with light soil, partly timbered with the remains of a light growth of hard timber, hemlock and pine. The burnt parts were thickly covered with blackberry briers. He had a hard race with the briers, and his first attempts at clovering were not successful, so that it became a matter of grave doubt with him whether grass seed would catch in that soil. But to use his own words "to seed down to clover now is easy enough. I cut good hay and keep sheep. My land grows firmer and better every year. I am satisfied my first seedings were not deep enough."

WHAT THE NEWER COUNTIES ARE DOING UNDER NEW CONDITIONS.

It is hard to give up old ways and conform to new, or to make allowances for a change of surroundings. The man from Richmond, Ind., gets his spring plowing all done and goes to Petoskey to look up a farm for his "Jeremiah," who is about coming of age. The ice is hardly out of the bay and the robin sits on one leg in a thick hemlock, out of the cold blast. The next scene is a ticket office and a journey home, and "no such miserable country for him where snow hangs on nine months in the year, and where people can raise nothing but 'tourists' and 'taters.'" Most persons would be glad of one crop a year of these, if the potatoes were eighty cents a bushel. A change of 400 miles in latitude ought to make some difference in the planting and harvesting of crops, and it does. So long though as Chippewa county takes the premium on wheat, and Grand Traverse sends down the premium fruit, we ought to be careful of running to that other extreme, and saying that "the climate is so cold that none but a Russian can live there," as bad as an old fogy almanac which gives the climate of all places according to their northing.

The productiveness of the older portions of Michigan has long been known, but the newer and northern portions have been under the ban of doubt. These counties are now filling up with an industrious population, and are demonstrating their capabilities beyond the expectations of their best friends. Wherever farming is done there as it should be, there are satisfactory results.

THE SELECTION OF A HOME.

II. *Look well after your lands, but don't look too long.* The foundation of success in farming is often in the character of the soil (as already mentioned) or in some advantage in location. The latter can not be foreseen in all respects, but some sites are clearly better than others. The man who locates behind a range of hills with no outlet for his timber "misses the mark." So does the one who selects a low, frosty flat, when he could just as well take a rolling, elevated tract. He who selects in a remote place may soon find himself in the midst of a thriving settlement, and those who once pitied that poor family who were obliged to go back into the woods so far from neighbors, may see the day when they will be sorry that they too were not of the company. It takes courage to do it but that is what wins. As illustrating such success after hardships encountered of this kind, we may mention the Reeder families and W. J. Morey of Missaukee county, the Danvilles of Manistee county, and the Monroes of Grand Traverse county. These all braved the hardships and far-away loneliness, and conquered the forests. The lumbermen came nearer—came to their very barns—and bought all they had to spare, and the long hauling to market was saved and a better price obtained. This success brought others, and soon permanent thriving settlements sprang up around them, and *they were out of the woods.* The writer well recollects trying to induce some families to take land at what is now

Fife Lake in Grand Traverse county, 23 miles from Traverse City. It was then a tract of pine bordering the small lake, with good farming lands farther back, but without a road, except a survey of a State road just made. The first question was, "How far back is it?" and no sooner was it answered than the offer was refused. Now the village of Fife Lake with railroad, mills, stores, and general business does not tell the same story. But the very best location will not insure success. Some men will starve where others thrive. The fields on the one hand will blossom with thistles and on the other bear luscious fruits.

We say don't look too long, for many in the confusion of sight-seeing are disconcerted. They believe every report, and run hither and yon only to find their last state worse than the first. Good openings can be found in any county for enterprise and labor; and so far as the cheaper lands in the newer counties are concerned they lie in all directions.

THE CHOICE OF A GOOD NEIGHBORHOOD.

III. *Select with some reference to the society best suited to your inclinations and needs.* Social privileges may be said to grow from seed planted, and the future of a town or settlement is largely determined by the character of its pioneers. So for long years after we point to one and say, "It is bad—better keep away from there if you have any regard for your family," and to another and say, "It is the best of society, the schools are sustained, the churches are flourishing; that place is worth seeking, if the land is not quite as good."

THE SCHOOL-HOUSE AND THE CHURCH.

The State of Michigan furnishes the best of proof of an advanced state of society. Go where you may in the most unfrequented settlement and there, perhaps at some cross-roads, or in the primeval forest, the log school-house will appear. It is quite the fashion in remote places to do even better than this, to build and paint and plaster, to seat and shutter just as older places do. Those who imagine that the newer counties are without such advantages as the free school offers, will be greatly surprised in traversing them to find so many well finished school-houses. At Alba, a small station in Antrim county, a school-house is now being built, veneered with brick, costing about $1,200, where a few weeks ago the tall forest trees were standing, and near a cluster of houses still very new. This is a fair sample of the way improvements are going on in Michigan. The families are hardly settled before the school and church are planned and built. While some places are still quite destitute and take very little interest in education, it is easy to locate where such advantages are prized. Even the earliest settlers in a new town are often much better situated as to schools than in the older places they have left, for they have all to build and can have their own way. It is only the *few* who are called to plant in this manner and those who reap from their labors should be grateful indeed. These advantages give value to property, and one of the first things a man will do, who wants to sell out, will be to count how near he is to the church, the postoffice and the school. A location with companionable neighbors is, too, very pleasant; and many families do not enjoy what they might, if more care was used in first selections. These surroundings may not be lasting; but who knows how they may influence a life?

THE CHOICE OF A HEALTHFUL HOME.

IV. *Locate for Health.* Unfortunately for the race there is no divining rod which can point us to the region of unfailing health. Worse than this, there is no such region. Health, like society, is as the mercury in the barometer tube, ever changing with its ups and downs. Hygiene, though, will bear a good crop if it is only tested

in the right place. You would not think of raising rice in a sheep pasture; neither can you keep off "the shakes" if you inhale the miasma of a mill pond. Health is individual and local. As pertaining to ourselves individually, it is in a measure beyond control. It leaves us unbidden. The most skillful are baffled in recalling it. As local, it can be improved by the changes that we make, by the better drainage we secure, the better houses we build and the better places we select for them. Health is so far controllable, and for our present purpose *comparative*, and a matter of *choice*.

MICHIGAN A HEALTHY STATE.

Michigan as a State is healthful. The record of its soldiers in the rebellion, for size, strength, and endurance, is noteworthy. Their attainments were not of a sickly kind. Some counties having large marshes, and which twenty years ago were not favorable to health, are entirely changed in this respect by the complete drainage which has been effected. And those counties not then much settled are proving the sanitarium of the State, and of other States. The thousands who frequent the many summer resorts, and drop their lines into the clear streams and beautiful lakes of these northern counties, let them testify. Verily they would say, "Our lines have fallen in pleasant places." We would not delude the stranger with any fancies, but let him know what others know who leave business every summer to get a sniff of delightful northern air, and go back all the better for it. We would let him know how many who reside here will say that northern Michigan has been to them the very gateway to a new life. It is not true that there is no ague at all here. The cases are very rare, though. This year there have been more than usual, perhaps owing to the extremely hot season; most of these cases are traceable to removable causes.

The selection of lands with their healthfulness especially in view is entirely practicable. Notice the surroundings. Is the spot high? Is it well drained? Is the water pure? Are there stagnant marshes or mill ponds flooding the adjacent lands or great quantities of saw-dust in decay? What report can you get about the locality generally?

PRACTICAL EXPERIENCES IN NORTHERN MICHIGAN.

From what has been said the reader may infer that we think Michigan is a good State, and the northern part of it as good as any. That there may be no mistake we say *yes, decidedly so!* Why should we not after living here over twenty years and knowing every portion of it as a surveyor? The best reason we can give for seeming partiality to this region is that we are writing of what we are most familiar with. Let others do the same. These counties will have a bright future, a vigorous, hardy, and thriving population. All the grains, fruits, and vegetables common in this and most of the northern States can be raised here, and some with much success. Wheat, oats, barley, rye, peas and buckwheat do well. Corn does not grow as large as further south, but dent corn is raised and this year was ripe and cut up as early as August 27. It yields from 30 to 50 bushels, shelled, per acre, the latter figure being not uncommon with good culture.

Recent reports from various points in the northern counties convey such information as this:

"The agricultural element is rapidly developing this section and many choice fields of clover are to be seen to-day, where two or three years ago stood the mighty forest. Manufacturing establishments are springing up and opening a market for our

acres of choice hardwood timber, thus encouraging the settler to clear his land. Those who became interested in early orchard planting are now enjoying the *fruits* of their labor."

"Two years and a half ago one of our young men contracted for forty acres of wild land. With nothing but his hands and an axe he has paid $7 per acre for said land, cleared twenty acres of the same, is out of debt and is building a fine residence which will be completed from cellar to garret by the first of January."

"There are many thousands of acres in hard-wood timbered land in northern Michigan yet for sale that will in a few years be valuable; and in some localities there is a good market for it now. 'Birdseye' and curly maple are quite plenty in this county and of the best quality. A few years ago it was a difficult matter to get people to believe that farming could be successfully carried on in this northern country. It was thought to be too cold, the seasons too short, to accomplish anything in that direction; but after a few years of trials it has been found to be one of the best locations for men of limited means. All kinds of crops do well and bring a good price. What it will cost a man to go west and locate land and buy teams and tools, and build a house, etc., and then perhaps only get a good crop about once in three years, will pay for 80 acres of land and leave quite a sum for improvements, buildings, etc., with a prospect of a good crop every year. The writer of this article has been here three years and has not seen a failure yet in crops."

A gentleman 77 years of age took a neglected place in this county this season, employed what help was necessary to fix up fences, plowed the land, and put in 200 bushels of seed potatoes. He will have not less than 3,000 bushels estimating by what has been dug, and can get 75 cents per bushel for them here. The place will be in good culture, and is much better to sell or to keep than it was when he commenced. It ought to be stated, however, that potatoes are higher this year than usual.

WHAT CAN BE DONE WITH LIMITED MEANS.

But you say "he had means to go on with and I have not." Let us see. Lands as good as that have sold in the past summer for $3 per acre. A young man who had saved up a small sum from working by the month, bought 80 acres of nice hard-timbered land for $3.50 per acre, or $280, paying $100 down, the remainder to be paid in two years at 8 per cent. Keeping it one year, he will have paid about $20 in taxes and interest, and at the end of two years his land will have cost him, taxes included, about $332. But he will have had the use of it for two years, and as there was ten acres from which the wood had been sold, he will have the small brush cleared from that and put it all in crops next year. This land in any ordinary season, if planted to potatoes, ought to yield at a low estimate 120 bushels to the acre, or 1,200 bushels, and these at 25 cents per bushel, which is a low price, would be worth $300. The cost of clearing in this case is very small, and so would be the cultivation of the crop, being on new land.

Try it in another way: If this land was sown to winter wheat a low estimate would be a yield of 16 bushels to the acre or 160 bushels. (Thirty-two bushels to the acre have been harvested on new land here.) At the present price—$1.22 per bushel—this would bring $195. The wheat being less expensive to market at a distance, might give as much profit as the other crop. Can the young man pay for his land?

Take a different case: Land was bought at $10 per acre, one-quarter down, the remainder bearing seven per cent interest. An average of 50 cords per acre of furnace wood was cut from it, and 20 cts per cord was paid for it standing, it being situated in a favorable place. Thus the land was paid for and left with only the brush and refuse timber to be cleared and could be put into spring crops.

Take still another case: A man living on a railroad at a new station, where a sawmill was being built, bought 40 acres at $12.50 per acre on the 9th of February last.

The snow was then deep, but he cut ten acres and hauled the best timber to mill, getting $3.50 per thousand. He cleared the lot in spring hurriedly, plowed it with a shovel plow among the green roots, and by June 15th had it half planted with potatoes and half sown with Hungarian grass. The potatoes had no hoeing, but by the last of August the tops entirely covered the ground. Three weeks after the potatoes were of the finest quality with an average yield. The grass was three to three and a half feet high where it was not sown too thick, as we measured it on September 1. It will be seen by this example that some crops may be raised very soon after taking the land. A very good plan is to cut all the small timber in the fall (called "underbrushing") and in the winter dispose of the best timber if possible; if not "fall it" in large windrows, cut the tops down well, and burn it when dry. The elm and basswood timber may be sawed into rail cuts, and when the frost is out of it in the spring split for fencing. Where cheap lumber can be had, the best fence is made of cedar posts and hemlock or pine boards. Cedar is generally abundant.

Let us look a little farther: Out on one of our railroads, less than a mile from a good school, are 80 acres of land timbered with large sugar maple, elm, and basswood, with some beech and hemlock; the soil is gravelly loam and water is readily obtained. It can be bought at $7 per acre, one-quarter down and the remainder on time at 7 per cent interest, or one-tenth less for cash. If you can, you had better pay all down, $504. If you buy the other way it would cost

One-quarter down	$140 00
End first year, with interest	169 40
End second year, with interest	159 60
End third year, with interest	149 80
Cost of land	$618 80
In this time the taxes might also be	20 00

To commence with you would need

Cash for the land	$140 00
For a good ox team	$150 or 160 00
For a wagon	$65 or 70 00
A log house, shingle roof, 2 board floors, doors and windows, need not cost over	50 00
A cow will cost	$25 or 30 00
A stable need not cost over	10 00
All farming tools needed for the first year	40 00
Total cash needed to commence with	$500 00

You have then a good start, but we have not given in this estimate the cost of clearing, of seed, and of feed and provisions. These can be offset by what the team will be able to earn, and the land to produce, as estimated before.

WAGES AND PRICES IN NORTHERN MICHIGAN.

Those who do not expect to engage in farming will not be interested in the examples given, but may wish to know whether general laborers, mechanics, and tradesmen can find a place in northern Michigan. We will let you answer. Suppose you find here, as you will, a vast country of good, low priced lands; of new settlements growing rapidly; of pine and other timber going out from here by the millions of feet every year; of lands being cleared and drained, with roads, bridges, railroads and buildings to be built, do you think you could get a place? The very common question here, aside from talks about the weather, is, *Where can I get help?* How long this will be so depends on business conditions at large, very much, and the increase of population. In a new country improvements are constant and labor in demand; all classes find enough to do, and so may you.

Nearly all materials and supplies are higher than a few months ago; these are the present prices: Common pine lumber, $9.00 per thousand; fine common pine lumber, $12.00 per thousand; for dressed lumber add $1.00 per thousand. Flour per barrel, $7.75; pork retails at 11½c; butter, 25 to 30c; potatoes retail at 80c, from farm wagons 70c, and are unusually high; so with corn, 88c, and oats 58c, the farmers getting 70c and 50c; stove wood, dry, $1.50, and green, $1.25 per cord delivered; hay $10 to $12 per ton.

We have not attempted to tell big stories to deceive the unwary, and hope readers may not be disappointed. You have our opinion of Michigan as a State for the immigrant, from the experience of some hardships and many pleasant days spent in its frontier settlements. *Come and see!*

October 17, 1881.

MICHIGAN AS A HOME.

A SETTLED SOCIETY.

Persons who are drawn towards Michigan by the attractions of cheap farms will find many advantages here which do not often accompany the possession of low-priced lands. Our northern counties contain thousands of acres as good in quality and as moderate in cost as those that are offered in States and territories hundreds of miles further from the seaboard, while they are all that distance nearer to the great markets of the continent. Our institutions and society are not those of a new and unorganized community, but of a rich, prosperous, and well-established State. We have four thousand miles of railway; great public buildings for civil, educational, and benevolent purposes, including a new State capitol, and all paid for; more than 6,000 school-houses, capable of seating nearly half a million of children, are scattered over every county in the State; two thousand churches of almost every known denomination afford conveniences for the stated ministrations of religion. The habits of the people are settled; no rankling public questions disturb their harmony; they are attached to the State and are proud of its importance. Justice is reverenced, life and property are protected, legislation is honest and public-spirited, education is generously cared for, there is a good standard of morality and intelligence, and taxes are low. The advanced civilization of the older States, and the great opportunities to labor and enterprise that are presented in the newer communities of the west, harmonize and co-operate here.

A WESTERN HOME FOR EASTERN MEN.

The New Englander or New Yorker who comes to Michigan finds himself at once in a community whose structure is precisely like that he has left. Our civil and social organizations are those to which he has been accustomed. Town and county officers have the same scope of duties and nearly the same designations. The school systems are practically identical. Public business and the administration of law are conducted on the same principles and in the same routine. Our forms are those into which he was born, and our traditions are inherited from the same source as his own. It does not take long for an eastern man to feel at home in Michigan.

FREEDOM OF CONSCIENCE AND OF SPEECH.

A fundamental principle of every American community, founded on one of the plainest rights of human nature, is absolute freedom of conscience. Every intuition of the people maintains it, and it lies at the basis of all our laws. The constitution of this State only declares the united sentiment of its population in the provisions it contains bearing upon this subject:

"The Legislature shall pass no law to prevent any person from worshiping Almighty God according to the dictates of his own conscience, or to compel any person to attend,

erect, or support any place of religious worship, or to pay tithes, taxes, or other rates for the support of any minister of the gospel or teacher of religion.

"No money shall be appropriated or drawn from the treasury for the benefit of any religious sect or society, theological or religious seminary, nor shall property belonging to the State be appropriated for any such purpose.

"The Legislature shall not diminish or enlarge the civil or political rights, privileges and capacities of any person on account of his opinion or belief concerning matters of religion.

"No law shall ever be passed to restrain or abridge the liberty of speech or of the press; but every person may freely speak, write, and publish his sentiments on all subjects, being responsible for the abuse of such right."

The spirit of these provisions is exemplified in the management of our public institutions. The first president of the State University, a devout Christian clergyman, when pressed to make appointments on denominational grounds, declared such appointments to be wrong in principle and injurious in practice. "They mistake egregiously," he maintained, "the character and ends of this institution who imagine that because it belongs to no sect or party in particular, it therefore belongs to all sects and parties conjointly and of equal right. It not only does not belong to any sect or party in particular; it belongs to no sect or party at all. The prime object of a seminary of learning is not like that of a church, to inculcate religion or perform its services, but to afford education. There is no safe guide in the appointment of professors save in the qualifications of the candidate."

RELIGION AND RELIGIOUS WORSHIP.

While all religious worship in this State is voluntary, it is nevertheless protected by law and cherished by the prevailing sentiment of the people. The sessions of the Legislature are opened by prayer. A time-honored and venerated custom requires the Governor to designate a day for annual thanksgiving, and in times of disaster and tribulation people assemble under similar appointment to invoke the Divine protection. At all great public observances, and in the commemoration of the national holiday, religious exercises are the opening proceeding. Chaplains of every denomination officiate at the State institutions. Daily prayers are offered in the chapel of the University during the academic year, but students are not coerced into attendance; and it in no wise conflicts with the sentiments of the first president of that institution, heretofore quoted, that, as reported by his successor, the present acting president, sixty of the eighty officers belonging to it are "communicants in the churches of several Christian denominations," and "every Sunday-school in the town, with one exception, is under the superintendency of some one of them."

Under a system so purely voluntary as this, religious belief and practice mark the character of our legislation and give tone to the moral sentiment of the community. The outward signs of their existence are visible in every village and hamlet. When the census of 1870 was taken there were 2,239 religious organizations in Michigan, 1,415 church edifices, and 456,226 church sittings, and, in the apportionment of the latter, 104,929 were held by the Methodist Episcopal denomination, 69,542 by the Baptists, 62,585 by Roman Catholics, 43,575 by Presbyterians, 38,355 by Congregationalists, 26,800 by Episcopalians, 23,150 by Lutherans, the remainder being divided among numerous other bodies in smaller numbers. This was in a total population of 1,184,059. The published returns of the census of 1880 are yet incomplete, but the enumeration of inhabitants showed an increase of nearly 40 per cent. over 1870, and there is no doubt whatever that there was a corresponding advance in the religious institutions of the State.

POPULAR INTELLIGENCE.

In 1880 the number of circulating libraries belonging to the public school system of this State was 1,606. In some of the larger places where several schools are combined into one district these libraries have attained considerable proportions. The public library of Detroit contains more than 40,000 volumes. That at Grand Rapids has more than 10,000 volumes. At Kalamazoo there are 7,900; at Bay City 7,600; East Saginaw has 4,765; Adrian and Battle Creek have each more than 3,000. As a means of popular education these libraries undoubtedly accomplish much good in cultivating a habit of reading. The books are drawn by any inhabitant of the district without charge, under no other restrictions than are required for their protection. The number of volumes belonging to them in 1880 was 261,993.

Besides these there are numerous other libraries in the State more or less public in their character, belonging to various societies and institutions. That of the University at Ann Arbor contains 38,500 volumes accessible to students; the Agricultural College has about 6,000; the Normal School nearly 2,500; the Institution for the Deaf and Dumb 2,000; the Reform School nearly 3,000; and the Public School for Dependent Children nearly 1,000. The incorporated colleges have an aggregate of nearly 30,000. The books in the State Library at Lansing number 35,000.

The people of Michigan are emphatically a reading community. Their local newspaper press has an exceptionally high average in the order of merit and enterprise, and is generally well supported. It has increased in numbers nearly 100 per cent in ten years, and in 1880 the entire number of periodical publications printed in the State was 418. Of these eleven were printed in the German language, five in Dutch, two in French, and one in Danish. Every village of any pretension has its newspaper, and the local interests and characteristics of nearly every section are well and faithfully represented by them. It is safe to say that in no State in the republic are there more newspaper readers in proportion to the population, or more readers who are better served with general and neighborhood news. Among the 38 States which compose the Union only seven issue as many newspapers as Michigan. Our voters as a class keep closely abreast of public affairs, and no more intelligent ballots are cast by the people of any community than those which are polled here.

A significant indication of the intelligence and commercial importance of a community is afforded by the extent of its correspondence and the amount of its expenditures for postage. The report of the Sixth Auditor of the Treasury Department for 1880 showed that in the year ending on the 30th of June previously there had been a larger disbursement for postage stamps, stamped envelopes, and postal cards in Michigan than in any other State of equal population. In New York, with its enormous commerce, the expenditure *per capita* was $1.18. Massachusetts, also the centre of great commercial as well as manufacturing and intellectual activity, expended $1.21 for each of its inhabitants. The next in magnitude to New York was Illinois, with its stirring and important city of Chicago and its connections with the entire Mississippi valley, which had paid 83 cents per head. Pennsylvania, rich in its industries and intelligence, had invested 67 cents for each member of its population, and Ohio, abounding in wealth and having eighty years' growth as a State, 66 cents. The *per capita* of expenditure for postage in Michigan, which was a wilderness when Ohio had a million of inhabitants, was precisely the same—66 cents. No other State or territory paid so much in the aggregate as either of these six States, except Missouri, and in Missouri the population was nearly a third greater than that of Michigan, and its expenditure seven cents *per capita* less.

The census of 1880 showed that the number of inhabitants of Michigan over ten years of age who could not read was a little less than three per cent of the whole population, and of those who could not write a little less than four per cent.

THE WEATHER AND THE SEASONS.

There are few things more difficult and unsatisfactory than an attempt to describe climate and the weather, and, however much any region may be favored in these important conditions, the subject is one which will always provoke criticism and complaint. It is the inherent right of all mankind to have a growl at the weather. But it can safely be claimed for Michigan that it has a healthy climate, and one that for twelve months in the year affords a very large average of bright skies and pleasant days. In either peninsula the advance of spring is not very marked before April, but it usually progresses rapidly when it opens, and the summers in the greater part of the State are never too short for the ripening of the crops. The autumn months are the glory of the year. In the lower half of the State the severity of winter is not felt much before Christmas, and on most days, in ordinary seasons, and throughout a territory not confined to the lower half of the State, most kinds of out-of-door work go on with little interruption until nearly the close of the year. One of the most striking phenomena to people freshly arrived from eastern and other States is the great number of bright days especially observable at this period. Fogs are of rare occurrence.

Snow falls earlier in the northern counties of the State than in the more southern, and usually before the heavy frosts occur. The results, in the sense most important to farmers, tend largely to equalize the length of the seasons. The grass and fall wheat, where this happens, are protected from freezing, pasturage is ready for stock as soon as the snow vanishes, and when the ground is dry enough it is fit for the plow. It not uncommon there for potatoes, left in the ground all winter, to be taken out in the spring entirely untouched by the frost.

A winter mean of about 25° and a summer mean of 68° Fahrenheit are about a fair average for the lower peninsula for a series of years, with an annual average of 47°. The winter mean is lower on the east side of the State than on the west, and the annual mean of the upper peninsula averages seven to nine degrees lower than it does below the straits. The climate of the State has been referred to in previous pages.

The navigation of the lakes is considered to be open when the breaking up of the ice will admit vessels through the Straits of Mackinac, though the river ports are always accessible sooner. During 25 years the earliest passage of the straits was on the 15th of March, in 1878, and the latest was on May 3, in the present year, 1881, just 30 days later than in 1880. The usual time is during the latter half of April. The dates for twelve years have been as follows:

1870.....April 17	1874.....April 29	1878.....March 15
1871..... " 3	1875..... " 30	1879.....April 22
1872..... " 28	1876..... " 28	1880.....April 4
1873..... " 29	1877..... " 18	1881.....May 3

According to the custom of marine insurance companies, policies on the hulls of merchant vessels expire on the 30th of November, which is considered the close of the season.

The States of Vermont, New Hampshire, Maine, and Minnesota all lie north of the meridian of Lansing, the capital of Michigan, and the railroad which passes through Canandaigua, Geneva, and Auburn in New York, is nearly on a line with that which intersects Owosso, St. Johns, Ionia and Grand Rapids. The Straits of Mackinac are within a fraction of being on the same meridian with Montreal, and are more than 50 miles south of Quebec. No part of the State lies as far north as Paris.

DROUTHS AND ATMOSPHERIC DISTURBANCE.

It is well known that wooded countries are not subject to the periodical drouths which visit regions where there are no trees. There are occasional periods of dry weather experienced here, usually occurring in the late summer or fall, which prove troublesome in localities where they are most severe and sometimes injurious to crops. An instance of this happened ten years ago, in 1871, at the time of the great Chicago fire, when the entire northwest suffered to a disastrous extent. In August and September of the present year (1881) a like misfortune occurred, and the forest fires which ensued during the latter month in the counties lying between Saginaw bay and Lake Huron involved large loss of both life and property. The territory which suffered by this calamity was burned over in the fires of 1871, and the dead wood which resulted lay in the partial clearings as dry almost as tinder. The aridity of the later summer months of 1881 was phenomenal both in the United States and in many parts of Europe. So far as the actual damage by drouth was concerned Michigan was much less afflicted than some of the neighboring States—far less than some of the more remote States. But the unusual and prolonged absence of rain gave fatal opportunity to the progress of the flames which had been carelessly started by settlers who sought this method of clearing the dead timber and underbrush from their farms, and the result was a calamity altogether without precedent in the history of the State, except in the similar disaster of ten years before. But the annual drouths which are so severely felt on the great plains and elsewhere are not known in Michigan. The numerous lakes and rivers which diversify the surface of the State largely mitigate the want of sufficient rainfall when that misfortune happens, and it is seldom that it is followed by more than a local inconvenience.

Neither is the State subject to devastating floods. The large lakes never overflow, and the spring freshets of the inland streams never reach the ruinous proportions that characterize more mountainous districts.

High winds are not uncommon in Michigan, but the State has never been the victim of such fierce and extended tornadoes as those which at intervals produce terror and destruction in the prairie country. Atmospheric disturbances are of only local and limited extent, are of infrequent occurrence, and are not of great violence. The suggestion of a cyclone excites no fears because the people have had no experience of its effects.

VALUE OF A TIMBERED COUNTRY.

There has been a period in the development of the western States when the heavy timber of the Michigan forests constituted an obstacle to its settlement, and the prairies of the Mississippi and Missouri valleys, by reason of their easier subjugation, were deemed more desirable by many immigrants. There is no doubt something very attractive in the idea of a field made ready by nature for the ploughshare, without the intervention of preparatory work, and the settler desirous of immediate results naturally gives weight to the suggestion it offers of diminished labor and early returns. But there are considerations that grow more urgent as experience enlarges, which impart grave importance to reasons for looking at the matter in another light. The timber which costs labor and delay to remove has become a source of income while in the process of being cleared, and above all it furnishes constant fuel to the household and fences to the fields of the farmer who has it on his lands. The expense and even suffering which are sometimes endured on prairie farms remote from supplies, for want of fuel, are unknown here. The cost of building material in a

out timber is of vital interest to new settlers who have their houses and barns to provide. The abundance of such material makes it cheap in Michigan. Every year the value of our timber becomes better appreciated. Even now tree planting is being practiced in some of the older counties on farms which a few years ago were covered with large maples and oaks, and which by a short-sighted improvidence have been suffered to become destitute. A well wooded farm is among the recommendations of thrifty agriculturists in our older counties. The judicious cutting of the untouched timber lands will provide for many wants, and one feature which ought always to be remembered should be a bountiful provision for shade in the pasture lands of the future. If it takes longer to make a farm in Michigan than in the prairie States, its results will abundantly compensate for the delay.

NATURE'S SUMMER RESORTS.

Michigan abounds in resorts for recreation which are available to the scantiest purses. Besides numerous points on the great lakes and their connecting rivers, which during nearly a third of the year attract multitudes of visitors from distant States as well as from this, there are more than 5,000 smaller lakes, situated in the inland counties, and in almost every section of the State. Some of these lakes are of limited area, and are partly surrounded by a marginal border of marsh land. But a large proportion of them have dry and pleasant shores, and some are more than a day's drive in circumference. Lakes covering an area of three to five square miles are common. The total area covered by them in the State is 1,114 square miles, or 712,960 acres. Some of them are connected by water channels, and small steamers ply on a considerable number for the convenience and amusement of passengers. They contain fish in great abundance, and are much resorted to by fishing parties and picnics. There are some that have acquired more than a State fame by their secluded position, beautiful wooded shores and general natural attractions. It is a common thing for parties to encamp on their banks during a portion of the summer in portable tents, living in primitive fashion and finding rest and health in the recreations of their waters and the surrounding woods.

The island of Mackinac, situated in the straits of that name and washed by the waters of Lakes Huron and Michigan, is the resort of thousands of people yearly from all parts of the Union. It was the site of a Jesuit mission before the foundation of Detroit, and the legends of the Indians made it a home for their gods long anterior to the advent of the white man. The purity of its atmosphere and general salubrity were widely recognized more than a century ago. The commanding altitude of its heights and promontories, some of them rising to an elevation of 300 feet, furnishes magnificent outlooks over the surrounding waters, which are so transparent that small articles can be discerned many feet below their surface. About 1,000 acres of this stately spot have been dedicated by Congress to the purposes of a National Park, and neither private speculation nor business enterprise can encroach upon its public character. Steamboats passing between Chicago and the ports of the upper and lower lakes touch at Mackinac daily during the season of navigation, and regular lines run thither also from Detroit.

Marquette on Lake Superior and Sault Ste. Marie on the straits of that name are also favorite resorts for people of more southern latitudes during the heats of summer, both for their bracing atmosphere and for the amusement of fishing. One of the charms of a journey to these points as well as to Mackinac is the delightful sail on the fine steamers which ply among those engaged in the navigation of the lakes. To those who prefer land travel, however, both Marquette and Mackinac are now [illegible] accessible by rail.

On the northern shores of the lower peninsula are also numerous points which, scarcely known a few years ago, have become the annual attractions of people from distances of hundreds of miles. All along the shores of Grand and Little Traverse bays villages have sprung up which are filled during the summer months with transient colonists. At Petoskey the Methodist denomination owns and controls several hundred acres of land, embowered in the forest, upon which it has erected numerous cottages, some of them very handsome and picturesque, and where every year a camp-meeting is held which attracts thousands. A few miles distant the Presbyterians have a rural retreat, while at Charlevoix there are a large number of commodious summer residences which are favored by Baptists but not controlled by any denomination. Friends and neighbors belonging to the southern counties of the State frequently buy adjacent property at various points in this region, and carry their accustomed society into their summer sojourning, where boating, fishing, freedom from business cares and simple living create new life. There are numerous points on Lakes Huron and Michigan and on the St. Clair and Detroit rivers which are also frequented in the season by visitors. Many families come to some of these places year after year from inland States and neighborhoods to enjoy the health-giving air of the lakes.

Not the least among the features which attach its people to Michigan are the great abundance, simplicity, cheapness and comfort of its summer resorts.

GAME AND WILD BERRIES.

Game, still very abundant in Michigan, must be reckoned among its important natural resources. Hares, rabbits, and squirrels are numerous in the settled as well as in the newer counties. The favorite bird, known to naturalists as the colin but commonly called the quail, is found in all the older parts of the State; it comes with civilization, and holds a place midway between the domestic and the wild fowl. That it thrives in this latitude and is likely to abide here permanently is shown by the fact that during the fall of 1881 sportsmen found it more abundant than in any immediately preceding year despite its very vigorous hunting in the past. Michigan is peculiarly the American home of the partridge or pheasant (ruffed grouse), so highly prized by epicures, and the prairie chicken (pinnated grouse) is found within its borders. The list of feathered game common in the State also includes the wild turkey, woodcock, snipe, and plover, and enormous flocks of pigeons annually make their nestings in the northern counties, and are there killed or captured in vast numbers. The lakes and rivers about and in Michigan abound both in web-footed fowls and edible fishes. Swans, wild geese, and ducks of all varieties and in countless numbers feed upon their surface. The statistics of the fishing interest of the great lakes have been already given. The interior waters of both peninsulas are well stocked with trout, bass, pickerel, perch, and other food fishes, while the only streams on this continent in which the grayling—that delight of European anglers—has been found are the Au Sable and a few neighboring rivers in Michigan. North of the valleys of the Grand and Saginaw the forests yet shelter vast quantities of large game. Occasionally a superb elk falls before the hunter's aim. Black bears are still quite numerous. The American deer, a noble specimen of the family of red deer, is so common, that it is estimated on excellent authority that not less than 70,000 of these fine animals were killed in this State during the single season of 1880. The fur trade of Michigan is still an important item in its commerce, and the beaver, otter, fox, mink, muskrat, and raccoon are trapped in large numbers, and their skins command a quick sale. The fiercer varieties of animals, however, are practically extinct. The black bear, except

at bay, is no more dangerous here than the deer. Wild berries grow luxuriantly in all parts of the State, the most prolific being the blackberry, raspberry, and cranberry, whortleberry. Nut-bearing trees are also common in its forests, wild honey in large quantities rewards the search of the bee-hunter.

The practical value to the settler of the vast stock of natural food thus briefly described is two-fold. With his rod or gun he can provide his own table with substantial food. Again, he can always find a ready market at good prices for such game as he does not consume, and thus make his skill in marksmanship or in angling contribute to his income. The pursuit of game is open to all upon equal terms, and no "preserves" exist in this State. The laws relating to this subject are limited to protecting game from extinction by killing during the breeding season or by wholesale slaughter, and to providing that it shall be kept for the consumption of the people of the State by prohibiting its exportation. Within these reasonable restrictions, and with due respect also to the rights of private property, any inhabitant of the newer districts of Michigan can make the forests and streams about his home contribute liberally to his larder and his purse. Nature there places within the easy reach of the poorest settler a wider range of selection from the choicest varieties of game than is open to many of the wealthy epicures of the old continent.

WAGES OF LABOR AND COST OF LIVING.

There has been a material advance in the wages of some kinds of skilled labor during the present year (1881), and an active demand for mechanics has prevailed in the later months, especially for those classes employed in the construction of buildings. Probably there has never been a period in the history of the State when so much progress was made in the erection of dwellings and business structures. The general prosperity of the country and the rapid growth of the State combine to create this condition. It is not confined to the large towns and business centres, many of which have made extensive and costly architectural additions, nor to mills and manufactories, which have multiplied in every section of the State, but it extends into districts that are strictly rural. The improvements in farm buildings within the year have been very marked.

It has also been an exceptionally expensive year for housekeepers. The advance in many articles of household consumption, especially in the products of the soil and the stockyard, was particularly noticeable during the fall months.

The tables which follow were compiled from figures obtained from intelligent and reputable citizens of the places mentioned therein. A uniform request was made to each to furnish the *average retail prices* of the articles named, and the *average wages* of the kinds of labor specified, for the year 1881. In each case the rate is somewhat higher than that which usually prevails. At the time most of these statistics were gathered the prices of food and of wages had reached their highest figure, and it is quite probable that in estimating the average this circumstance may have been less carefully considered in some localities than in others, which would account for a few apparent disparities. One or two points are omitted in the tables from which efforts to obtain information proved unavailing. But a clear and intelligent idea of the value of labor and the cost of leading articles of food in this State may be gathered from what follows, and fair conclusions may be drawn from it indicating the prevailing prices of farm, garden and barnyard products. The places designated represent fifteen important business centres, situated respectively in the counties of Alpena, Calhoun, Cheboygan, Genesee, Grand Traverse, Ingham, Jackson, Kent, Lenawee, Manistee, [illegible], Mecosta, Saginaw, Sanilac, and Wayne, and a glance at the map will [illegible]graphical relations to the rest of the State.

Average Wages of Labor at the

OCCUPATIONS.	Adrian.	Alpena.	Battle Creek.	Big Rapids.	Cheboygan.	Detroit.
Carpenters and joiners, per day	$2 00@3 00	$2 50@4 00	$1 75	$2 00@2 25	$1 75@2 50	$2 00@2 50
Masons, per day	2 50@3 00	3 00@3 50	2 50	2 00@3 00	2 50@3 00	2 50@3 00
Bricklayers, per day	2 50@3 00	3 00@3 50	2 50	2 50@3 50	2 50@3 00	2 50@3 00
Plasterers, per day	2 00@2 50	3 00@3 50	2 50	2 00@3 00	2 50@3 00	2 50@3 00
House painters, per day	2 00@2 50	3 00@3 50	1 75	2 00@2 25	2 00@3 00	1 50@2 25
Blacksmiths, per day	1 50@1 75	2 00@2 50	2 00	1 50@2 50	2 00@2 50	1 50@2 50
Shoemakers, per day	1 50@1 75	----------	1 75	1 75@2 25	----------	1 25@1 75
Coopers, per day	1 25@1 50	----------	----------	2 00@2 50	1 50@2 00	1 50@2 25
Millwrights, per day	2 00@3 50	3 00@4 00	----------	3 00@3 50	2 50@3 00	2 50@3 50
Mill hands, per day	1 50@2 00	1 50@1 75	----------	2 00@3 50	$1 50	1 50@2 00
Brickmakers, per day	1 25@1 50	----------	----------	1 50@2 00	----------	1 75@2 00
Teamsters, per day	----------	----------	1 25	$1 50	1 50	1 00@1 50
Choppers, per day	$1 00	----------	1 00	1 00	1 50	----------
Teams—2 horses and driver, per day	2 50@3 00	3 50@4 00	2 75	4 00	2 50@3 00	3 00@3 50
Laborers, porters, etc., per day	1 00@1 50	1 25@1 75	1 25	1 50@1 75	$1 50	1 00@1 50
Farm hands, per month with board	$16@20 00	$20@22 00	15 00	$16@25 00	$20@24 00	----------
Female domestics, per week with board	$1 50@2 50	$2 00@3 00	2 25	----------	$1 50@2 50	$1 50@3 00

Explanations are given with some of the reports from which this compilation is made that cannot be tabulated. The following figures are added: Adrian, teamsters $16 to $20 per month and board; Alpena, teamsters $22 to $26 a month and board, choppers the same; Manistee, teamsters $26 to $30 a month and board, choppers $22 to $26 a month and board, teams of two horses $60 a month and board; Port Austin, teamsters

Average Retail Prices of Articles of Household

PRODUCE, ETC.	Adrian.	Alpena.	Battle Creek.	Big Rapids.	Cheboygan.	Detroit.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
Beef—Best roast and steak, per lb	10@12½	11@15	12½	8@10	15	12@15
Boiling pieces, per lb	5@ 7	8@10	6	5@ 8	12½	6@ 8
Soup pieces, per lb	5	5@ 6	5	5@ 8	10	5@ 7
Corned, per lb	5	7@ 9	7	5@ 8	8	8@10
Veal—Forequarters, per lb	8	10@12	8	6	15	8@10
Hindquarters, per lb	10	10@14	10	8	15	10@12
Mutton—Forequarters, per lb	6	10@12	9	5@ 6	15	8@10
Hindquarters, per lb	8	12@15	10	6@ 8	15	10@12
Soup pieces, per lb	4	7@ 8	6	4@ 5	10	6@ 7
Pork—Fresh, per lb	10	11@14	10	5@ 8	12½	10@12
Salt, per lb	10@12	9@11	12½	7@12	11	10@12
Ham, per lb	10@12½	12@15	12½	11@14	14	14@18
Shoulder, per lb	6@ 8	10@11	8	7@13	10	8@10
Sausage, per lb	10	12@14	12½	10@12½	12½	10@12½
Fresh fish, per lb	4@ 8	4@ 6	8@10	6	----------	7@10
Chickens, per lb	8	10@15	10	----------	15	10@12
Lard, per lb	10	11@15	15	10@15	15	13@15
Butter, per lb	20	22@30	20	14@35	30@35	25@30
Cheese, per lb	12	15@18	17	11@18	15	15@18
Coffee—Rio, per lb	14@20	15@25	18	15@20	20@25	15@18
Tea—Young Hyson, per lb	50@85	25@60	50	30@80	25@60	50@80
Japan, per lb	40@75	25@60	50	30@80	25@60	45@60
Brown sugar, per lb	7½@10	8@10	9	8@ 9	10	8½@ 9
Coffee sugar, per lb	10@11	10@12	10	9@11	11	9¾@10¼
Potatoes, per bushel	$1 00@1 10	50@75	75	40@80	80	80@1 00
Beans, per quart	8@12	----------	10	8@10	12½	8@12
Milk, per quart	4@ 5	6@ 8	5	5@ 7	6@ 8	6@ 7
Eggs, per doz	15	18@22	14	12@25	20@30	18@28
Wood, per cord	$3 50@5 50	$2 50@3 00	----------	$1 00@2 50	$2 50@3 00	$4 00@6 50
Board for single men, per week	$3 00@4 00	$3 50@4 00	$2 50	$3 00@4 00	$3 50@5 00	$3 50@5 00

The important article of flour, not included in the foregoing table, has a staple value which is not much affected by the location of business centres in States where transportation is as abundant as it is here. There have been unusual fluctuations, however, in the markets of the year, and like other products it bears at present more than average

places named for the Year 1881.

Flint.	Grand Rapids.	Jackson.	Lansing.	Manistee.	Muskegon.	Port Austin.	Saginaw and E. Saginaw.	Traverse City.
$1 [illegible]	$1 [illegible]	$2 [illegible]	$2 [illegible]	$2 [illegible]	$2 [illegible]	$2 00@3 00	$2 00@2 50	$1 50@2 25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

WAGES, ETC., IN THE UPPER PENINSULA.

A letter from the Assistant Commissioner of Mineral Statistics, dated at Marquette in September, 1881, furnishes information concerning that portion of the State as follows:

"Miners receive per day of ten hours from $2 to $2.25. They work one week day-shift, and one week night-shift, alternating. Miners working on contract make $2.50 to $3.50 per day. Prices are about the same the year round. Furnace men get $2 to $2.25 per day; the founder $1,500 to $1,800 per year. Surface laborers at the mines get $1.75 to $2.00 per day; laborers on the railroads $1.80 per day; teams $5 per day; farm hands $1.50 to $1.75 per day, exclusive of board. Carpenters, painters, etc., receive $3 per day; masons $4 per day; wood choppers $1 per cord. The demand for labor is good, fully equal to and rather in excess of the supply, especially for experienced miners.

"The board of single men costs them $18 per month. The cost of living is a quarter to a third more than in lower Michigan.

"The wages in the copper regions average about the same as here.

"Upper Michigan must ever be a field which will require the labor of a large number of men at remunerative wages, varying of course with the demand for iron and copper, but the country is improving rapidly, and other fields than mining will require labor in the future to a much greater extent than has prevailed in the past."

MICHIGAN HOMES.

The large proportion of people who own the homes they live in is a peculiar characteristic of American communities, which is made more conspicuous by contrast with other lands. Michigan is a particularly forcible illustration of this feature. It is a custom which propagates by example, and the social, political and business conditions of the State all encourage it. A rented farm is scarcely known. Most of the dwellings in our cities and villages belong to mechanics and workingmen who are their own tenants. Among those who are thrifty it has become a habit to invest the first savings in a house. There is choice enough among the building lots of every place to meet almost every pecuniary condition, and a few hundred dollars judiciously used will secure a comfortable home in any town in the State. A practical farmer who has any means at all can with even greater facility establish himself on land of his own, with a reasonable certainty, if he deserves it, of financial independence, increasing comforts, a respected life, and a good outlook for his children. It is the workingmen of this class, the men who respect labor and owe to it, under the blessings of Providence, all their success, who control the political affairs of the State; and it was the same class who, thirty years ago, declared their respect for the sanctity of a home, by incorporating in its written constitution these provisions against the contingencies of misfortune:

"Every homestead of not exceeding forty acres of land, and the dwelling-house thereon, and the appurtenances to be selected by the owner thereof, and not included in any town plat, city, or village; or instead thereof, at the option of the owner, any lot in any city, village or recorded town plat, or such parts of lots as shall be equal thereto, and the dwelling-house thereon, and its appurtenances, owned and occupied by any resident of the State, not exceeding in value fifteen hundred dollars, shall be exempt from forced sale on execution or any other final process from a court, for any debt contracted after the adoption of this Constitution. Such exemption shall not extend to any mortgage thereon, lawfully obtained; but such mortgage or other alienation of such land by the owner thereof, if a married man, shall not be valid without the signature of the wife to the same.

"The homestead of a family, after the death of the owner thereof, shall be exempt from the payment of his debts contracted after the adoption of this Constitution, in all cases, during the minority of his children.

"If the owner of a homestead die, leaving a widow but no children, the same shall be exempt, and the rents and profits thereof shall accrue to her benefit during the time of her widowhood, unless she be the owner of a homestead in her own right."

COMMISSIONER OF IMMIGRATION.

In his inaugural message to the Michigan Legislature at the beginning of its biennial session in January, 1881, Governor Jerome used the following language:

"There are millions of acres of good farming lands in this State unoccupied. The building of the lines of railroad traversing the entire length of the lower peninsula north and south, together with the east and west roads lately completed, and the prospective completion at an early day of the Detroit, Mackinac, and Marquette railroad, has opened and will open to easy access a vast extent of unoccupied farming lands. The influx of settlers upon these lands would add largely to the productive wealth and taxable resources of the State. Through the potent influences of the proper agencies, emigrants have been taken beyond Michigan, and great States have been built up west of us, and this largely by judicious systems of making known their advantages. No State or Territory east or west has advantages superior to those of Michigan. To secure our share of the emigrants now landing upon the shores of the United States, and of the surplus population of the eastern States, we should make known our resources, so rich, numerous, and varied—our fertile lands now in market at moderate prices, our admirable school system, and the many attractions offered to the emigrant who desires not only good soil and a healthy climate, but good markets, good government and pleasant social relations, which are assured by the general character and traditions of Michigan society."

In accordance with these suggestions the Legislature in June following passed a law authorizing the appointment of a Commissioner of Immigration, to act under the advice and direction of the Governor, "for the purpose," as declared by its terms, "of encouraging immigration to Michigan from the other States and from the countries of Europe." The obvious intent of this enactment was that its object should be sought by giving wider publicity to the resources and characteristics of the State, and the direct methods which it is proposed to employ in its accomplishment are the diffusion of reliable information, the stimulation of inquiries among the people of "other States and countries," the acquisition through personal acquaintance and correspondence of facilities for prompt and intelligent replies, and direct intercourse or communication with parties seeking new fields of labor and enterprise. There is no design to solicit colonization for the sake merely of enlarging the number of inhabitants. What the State invites is men who will add to its industry, increase its resources, develop its soil, and take an interest in its prosperity, and this class are to be addressed through their intelligence and sense of thrift. Fortunately, the strongest claims that can be advanced in behalf of Michigan are contained in a simple statement of facts.

It is in pursuance of the will of the Legislature that this pamphlet is published. It has been prepared with scrupulous care to avoid mistakes or exaggerations, and it goes to the public with a full sense of the responsibility involved in the fact that it is issued under the sanction of the State. The figures which have been employed in its compilation have been taken from official sources, or have been furnished by recognized authorities, and the statements it contains are believed to be reliable. It is intended principally as an exposition of the general resources and characteristics of Michigan, and will serve, it is hoped, to elicit inquiries for more minute informa

In the furtherance of its work it is thought the office may also become use promoting a better knowledge among our citizens of the wealth and possibili their own State. If this knowledge shall be sufficient to satisfy young men of means belonging to our own families in the older counties that there are oppor for them here in Michigan more promising than the attractions, seen thro enchantments of distance, in the States and Territories of the remote and West, it will serve a double purpose.

The coöperation of citizens in all parts of the State, especially of those living in its newer counties, is respectfully desired. Notes of information concerning the various sections will be carefully gathered and classified. The office cannot of course discriminate in favor of local or separate interests, but it will be glad to furnish inquirers any authentic intelligence of a public character that may come into its possession; and in this work known individuals who are interested in the development of the State may render valuable assistance.

The selection of localities is not included among the duties or functions of the office. It will do all in its power to enable persons to form an intelligent judgment concerning the general features and characteristics of each county, by answering questions regarding them, and it especially recommends that individuals or colonies proposing to become residents of Michigan shall make personal inspection before deciding upon a settlement or employ a trusted and competent agent of their own choosing to do so. "The soil of the State," said one of the professors at the State Agricultural College, in an address before a Farmer's Institute a few years ago, "often passes by abrupt transitions from one kind to a very different kind. No prudent man desiring a given kind of soil will buy a farm unseen, but will carefully examine it to see if it be the kind he seeks. For one kind of farming he desires a strong clay, for another he wants a quick and warm sand. The great variety of soils found in our State seems to show that nature designed it for a widely diversified industry." There are lands also in the State which will not repay the labors of the agriculturist. There is no county which does not contain some poor soil, and none, in which agriculture has been tested, which will not produce some good crops. There is no transaction in life that more imperatively demands the exercise of individual judgment than the selection of a home.

Copies of this pamphlet will be sent on application to those who are seeking information concerning the character and resources of the State, and residents of Michigan having friends elsewhere to whom they may desire to impart similar intelligence are invited to furnish this office with the names and postoffice address of such persons.

Inquiries, written or verbal, will receive prompt attention if directed to the Commissioner of Immigration, Detroit, Michigan.

ADDENDA.

Preliminary bulletins of the census returns of 1880 made the population of Michigan in that year 1,636,331, and those figures have been used in the earlier pages of this work, as well as in the table printed on the accompanying map. The latest revision of the Census Bureau places it at 1,636,937.

The report of the Railroad Commissioner of Michigan for 1880, issued as this pamphlet is being printed, shows that freight was carried by the railroads of the State in that year at an average rate per mile of eight and six-tenths mills per ton, or six-tenths of a mill less than the remarkably low rate of 1879.

A contract was let in November, 1881, by the Grand Rapids and Indiana Railroad company for the immediate extension of its main line from Petoskey to Mackinac.

The preliminary report of the U. S. Census Bureau on the iron-mining industry shows that in 1880 Michigan was the second ore-producing State in the Union. Pennsylvania then yielded a little over 27 per cent of all the ore mined in the United States and Michigan a little over 23 per cent, the latter being four per cent better in quality. The returns of 1881 to the present writing indicate little doubt that Michigan has this year passed Pennsylvania in the quantity as well as quality of the annual yield of its iron mines, and that it has become the first iron-producing State of this continent. The statistics of this production which have been used in this pamphlet are taken from the compilations of Mr. A. P. Swineford of Marquette.

The salt product of Michigan during the inspection year of 1881 was 2,745,656 barrels; the average price per barrel during the year was 95 cents.